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WATER SUPPLY, & SANITARY IMPROVEMENT.

[Registered as a Newspaper.]

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GAS PURIFICATION
BY
OXIDE OF IRON.

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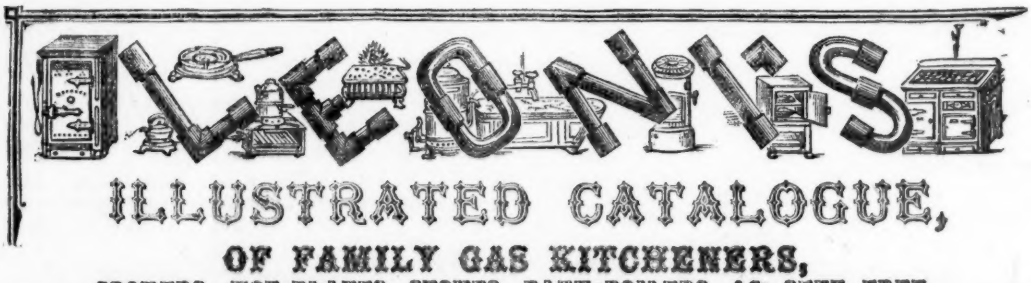

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Sixteen recently erected at Beckton, applied to Covers 30 feet square.

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IN SUCCESSFUL OPERATION AT THE NEW WORKS OF THE NEWCASTLE AND GATESHEAD GAS COMPANY, AND IN COURSE OF ERECTION AT THE CARLISLE CORPORATION GAS-WORKS.

Special "REGULUS COCKS" manufactured to stand Acid.

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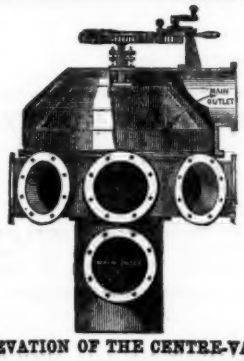
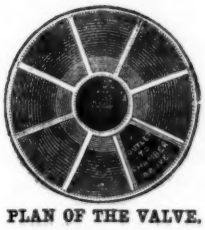
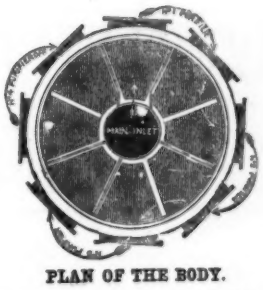
PATENT CENTRE-VALVES.



ELEVATION OF THE CENTRE-VALVE.



PLAN OF THE VALVE.



PLAN OF THE BODY.

These PATENT CENTRE-VALVES are the most perfect and certain means for working Purifiers on the system of three in action, and one out of action. The Valve itself is protected from all injury inside the safety cover. The working of the Valve is so easy, and so governed by the stop-catch movement, that the Purifiers can be instantaneously changed in the dark as well as in daylight. They are scraped perfectly true, metal to metal, the facings heretofore exposed are always covered, and there is nothing more reliable, certain, and durable in a gas-works. By their use the floor of the Purifying-house is clear and level, the Valve and all connexions being beneath the floor, out of the way of working. A considerable improvement and saving is effected in the cost of the connecting pipes.

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ARE NOW PREPARED TO SUPPLY AND ERECT THEIR PATENTED MACHINERY FOR

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And to enter into arrangements with GAS COMPANIES for its use upon moderate terms of Royalty.

The Patented Machinery has secured the approbation of all Engineers who have visited the MAIDSTONE GAS-WORKS, *where it is in full operation, and may be inspected at any time on application to the Manager.*

The advantages attending its use are—

INCREASED VOLUME OF GAS PER TON.—INCREASED YIELD PER RETORT.—INCREASED BULK OF COKE FOR SALE.—REDUCTION IN LABOUR AND LESS DEPENDENCE ON SKILLED STOKERS.

A Pamphlet containing a description of the Machinery, and Copies of Reports on the working of the same, &c., will be forwarded on application to the MANAGING DIRECTOR, Maidstone. Communications may also be addressed to the Consulting Engineer, R. P. SPICE, Esq., M. Inst. C.E., 21, Parliament Street, London, S.W., or to the Engineer and Analyst, F. W. HARTLEY, Esq., A. Inst. C.E., 55, Millbank Street, London, S.W.

EDWARD COCKEY & SONS,

GAS ENGINEERS, FROME SELWOOD,

MANUFACTURERS OF ALL DESCRIPTIONS OF

APPARATUS CONNECTED WITH GAS-WORKS.

THE ORIGINAL PATENTEES AND MANUFACTURERS OF THE

DRY-FACED VALVES

FOR PURIFIERS, GASHOLDERS, BYE-PASS, AND OTHER ARRANGEMENTS REQUIRING VALVES IN GAS-WORKS.

The Faced Valves, as made by the Patentees, continue to give great satisfaction, and they are being used extensively by many of the best gas engineers of the day.

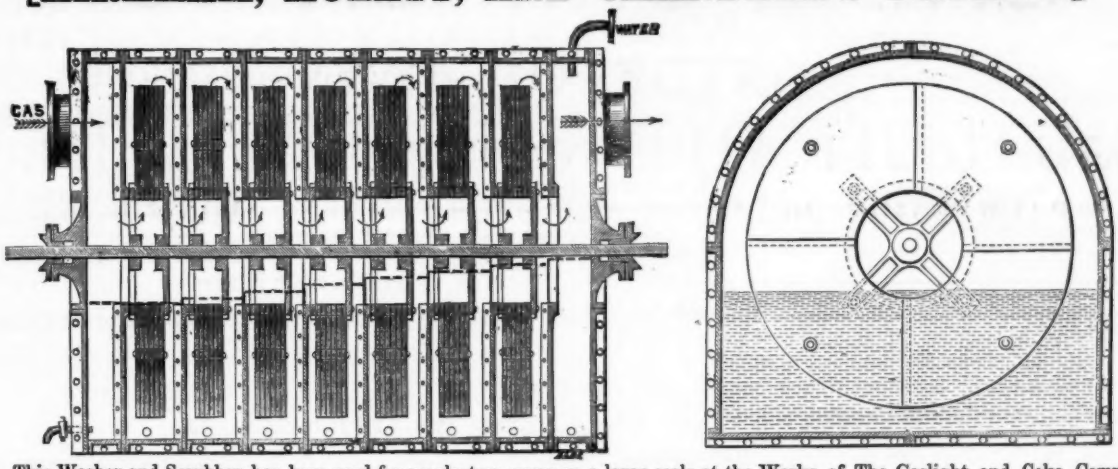
They are more easily repaired than any other kind of Valve in use, and can be re-ground in a few hours without removal, and made perfectly gas-tight.

References can be given to many Engineers of high standing, who will testify as to the favour in which they are held.

MANUFACTURERS ALSO OF SUPERIOR WOOD GRIDS FOR PURIFIERS, SCRUBBERS, &c.

THE "STANDARD" WASHER & SCRUBBER.

[KIRKHAM, HULETT, AND CHANDLER'S PATENT.]



This Washer and Scrubber has been used for nearly two years on a large scale at the Works of The Gaslight and Coke Company, Bromley-by-Bow, at which station there are now several in operation and in course of construction. There is also one in use at the Pancras Station, King's Cross, of the same Company, which is purifying 1,500,000 cubic feet of gas per day. At the Gas-Works of the Corporation of Leeds, a large one has been erected, which is giving complete satisfaction. The Special Merits of this Washer are as follows:—

That it is a very effective Condenser, so that it is not absolutely necessary to reduce the temperature of the gas to 60°, or thereabouts, to make the Washer effective. That the distribution of the liquor is made with unerring regularity. That it occupies very small space, so that it can be, at little expense, effectually protected from extreme changes of the weather. That the considerable expense of Coke or Wood, or other Scrubbing Material, is entirely saved, and that the great nuisance and cost of from time to time replacing the Scrubbing Material is avoided. That, by the revolution of the discs, the quantity of water carried up by them, and tending continuously to fall, exposes a very large amount of fresh wetted surface to contact with the gas. That it is particularly adapted for Gas-Works where Sulphate of Ammonia is manufactured. That it is much cheaper than any other Scrubber that will do the same amount of work effectually. That it is the only Washer suitable for purifying Gas from all its impurities by solution. That it works with a minimum of pressure. That it takes out every trace of Ammonia from the Gas in once traversing the machine. That it requires very little outlay for foundations.

The following Testimonials show the opinion of eminent Engineers as to the capabilities of the Washer:—

D. HULETT, Esq. *The Gaslight and Coke Company, Bromley-by-Bow, May 3, 1877.*

Dear Sir,—In answer to your inquiries respecting the results of the working of your Patent Washer, I beg to state that I find it a very efficient machine. I have had it in operation for some time, and passed gas through it continuously at the rate of 100,000 cubic feet per hour, and obtained from it 11 gallons of 10 oz. liquor per ton of coal carbonized—results which appear to me very satisfactory for so small a Washer. It works very smoothly, taking but little power, and giving no pressure. I have it still in operation, and am perfectly satisfied with its working.

I am, dear Sir, yours truly, (Signed) W. B. WRIGHT.

Messrs. KIRKHAM, HULETT, and CHANDLER. *The Leeds Corporation Gas-Works, York Street, Leeds, Dec. 6, 1878.*

Gentlemen,—The Scrubber-Washer erected by you at these works, and which has been in use for six months, has proved to be, so far as we have been able to test it, thoroughly efficient. We are at present making 32,000 feet of gas per hour, and are entirely dependent on this apparatus for the removal of Ammonia, and the **Gas is perfectly free from that impurity in the sixth chamber,** so that four chambers remain to deal with an increasing make of gas. Owing to insufficient condensers, the gas was in the summer admitted to the Scrubber at a temperature of 70°, but was reduced therein to 61°, or that of the atmosphere. The volutes are driven at the rate of four revolutions per minute, and, working at that speed, there is not the slightest difference between the inlet and the outlet pressure. Clean water supplied at the rate of 10 gallons per ton of coal carbonized is converted into liquor of from 10 oz. to 13 oz. strength **in once traversing the vessel.** The apparatus is extremely simple and compact, occupies but little space, and requires no foundation. I shall be surprised if it does not eventually become extremely popular.

I am, Gentlemen, yours faithfully, (Signed) HENRY WOODALL, Engineer.

Messrs. KIRKHAM, HULETT, and CHANDLER. *The Gaslight and Coke Company, York Road, King's Cross, Jan. 14, 1879.*

Gentlemen,—In reply to your inquiry, I am pleased to say, the Washer which was put in action at this station in October last has quite fulfilled my expectations, as it confirms the experiments I made in May last with the smaller machine. Working at four revolutions per minute, **it takes out every particle of Ammonia,** while purifying more Gas than it was intended to do. I enclose particulars of a fortnight's working during our heaviest make, by which you will see that it yields the full quantity and strength of liquor, and works with little pressure. I am therefore quite satisfied with the machine, and trust it may meet with the success it deserves.—I remain, &c. (Signed) JOHN CLARK.

The following Table shows the results of the working of one of these Washers, lately erected to purify 60,000 feet of Gas per Hour, at the St. Pancras Station of The Gaslight and Coke Company:—

1879.	Nos. of the Divisions and Strength of Liquor in each.										Water used per Ton of Coals.	Gas Purified per Hour, Cubic Feet.	Ammonia on Outlet.	Temperature.			Pressures.		Revolutions per Minute.
	1	2	3	4	5	6	7	8	9	10				Inlet.	Outlet.	Atmosphere.	Inlet, Inches.	Outlet, Inches.	
	oz.	oz.	oz.	oz.	oz.	oz.	oz.	oz.	oz.	oz.									
January 1	8½	6¾	5	3½	2½	1½	¾	¼	0	0	10 Gallons.	52,000	Nil.	77°	73°	48°	24	23	7½
,, 2	8¾	7	6	4¼	3¼	2¼	1¼	½	¼	0	10 ,,	57,000	Nil.	73°	66°	32°	21½	20½	4
,, 3	9¼	8	6	3¾	3	2¼	1¼	½	¼	0	10 ,,	60,000	Nil.	75°	68°	40°	23½	22	4
,, 4	9¼	7¾	6¼	4¼	3¼	2¼	1¼	½	¼	0	10 ,,	65,000	Nil.	74°	68°	33°	24	22½	5
,, 5	9½	7	6	4	3	2¼	1¼	½	¼	0	10 ,,	34,000	Nil.	77°	68°	35°	14½	14	5
,, 6	9¼	7¼	6¼	4¼	3	2¼	1½	1	¼	0	10 ,,	63,000	Nil.	72°	66°	27°	24	22½	4½
,, 7	11	9	7	5½	3¾	3	1¾	1½	¼	0	10 ,,	59,000	Nil.	74°	66°	31°	25	23½	5
,, 8	9½	7½	6	4½	3	2	1	½	¼	0	10 ,,	78,000	Nil.	73°	61°	31°	28	26½	4½
,, 9	11	9	7	5	3¾	2½	1¼	1	¼	0	10 ,,	82,000	Nil.	74°	67°	33°	27½	25¼	5
,, 10	10¾	8½	6¾	5	3½	2½	1½	1	¼	0	10 ,,	66,000	Nil.	76°	64°	28°	28½	27	5
,, 11	12½	10	7¾	5¾	4¼	3¼	1¾	½	¼	0	10 ,,	61,000	Nil.	73°	64°	27°	26½	25¼	5
,, 12	11	8¾	6¾	—	—	—	1½	½	¼	0	10 ,,	39,000	Nil.	74°	64°	27°	26½	25½	5
,, 13	13	10¾	8¼	6	4¾	3¼	2	1¼	½	0	10 ,,	78,000	Nil.	73°	65°	42°	28	26	5

Messrs. KIRKHAM, HULETT, and CHANDLER. *Corporation of Birmingham, Gas Department, Saltley Works, May 23, 1879.*

Gentlemen,—I beg to enclose you a copy of the results of the tests which, by the kind permission of the Engineer, Mr. Clark, I made on the 6th of March last, of the working of one of your "Standard" Washers and Scrubbers at the St. Pancras Station of The Gaslight and Coke Company, and I am of opinion that, for an apparatus occupying so small a space, they are exceedingly satisfactory.—Yours truly, HENRY HACK, Engineer.

Working Results obtained from KIRKHAM, HULETT, *and* CHANDLER'S *Patent "Standard" Washer and Scrubber at the St. Pancras Station of The Gaslight and Coke Company, London, March 6, 1879.*

Gas passing per Hour, Cubic Feet.	—	Impurities in Gas per 100 Cubic Feet.			Temperature.		Pressure in Inches.	Revolution of Apparatus per Minute.	—	No. of Divisions and Strength of Liquor.										Water Used during Experiment. Gallons.
		SH_2	CO_2.	Grains. NH_3.	Washer.	Air.				—	—	—	—	—	—	—	—	—	—	
64,000 {	Inlet	2·00	2·00	158·8	72	57	21	4	Twaddel deg. at 60°	5·2	4·9	2·85	2·35	1·7	1·05	0·6	0·3	0·15	0·1	63
	Outlet	1·50	1·50	0·8	68	57	20		Acid, ounces.	11·0	8·4	6·3	4·5	2·7	1·7	1·3	0·7	0·3	—	

WASHER-SCRUBBERS OF THIS PATENT ARE IN COURSE OF CONSTRUCTION FOR BECKTON, BRADFORD, GREENWICH, WOOLWICH, AND SEVERAL OTHER GAS-WORKS.

For further particulars and testimonials, address

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WOOD PURIFIER SIEVES,

Which have now been used for fifteen years, and their advantages and durability fully established. They are made entirely by steam machinery in very large quantities at the most moderate cost.

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DONNINGTON, NEAR NEWPORT, SHROPSHIRE.
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COTSWOOD FIRE-BRICK WORKS, SCOTSWOOD-ON-TYNE.
Also Makers of all kinds of Common Building Bricks, and of Pressed White and Red Bricks for Facing.

ESTABLISHED IN 1860.
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ALSO OF
Archer's Patent Stone Breaker,
AND OF
Archer's Patent Ore Crusher & Pulveriser,
The last-named Machine (without the Pulveriser) makes the best and most durable Coke Breaker.

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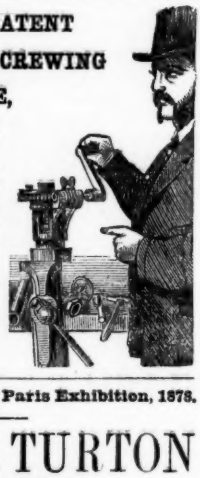
AND
WENLOCK IRON WHARF, 21 & 22, WHARF ROAD, CITY ROAD, LONDON, N.,
Manufacture and keep in stock at their works (also a large stock in London) PIPES and CONNECTIONS 1½ to 48 inches in diameter; and make to order Retorts, Purifiers, and Tanks, with or without planed joints, Columns, Girders, Special Castings, required by Gas, Water, Railway, Telegraph, Chemical, Colliery, and other Companies.
NOTE.—Syphons and Covers are joint-faced if required, doing away with millboard and iron boring, or Syphons made without Covers, a socket being cast on and fitted with a small plug about 6 inches in diameter with lead joint. In either way preventing leakage.

GRIRDROD'S PATENT
PORTABLE PIPE SCREWING MACHINE,



For 1 in., 1¼ in., 1½ in., and 2 in. Gas Threads, complete £7 10s.
In use at the chief gas-works, and giving great satisfaction.
For other useful goods, see Bailey's "Illustrated Inventions," post free 3s. 6d.; gratis to ledger customers.
W. H. BAILEY & CO.,
Brassfounders, Gauge Injector and Tool Makers,
ALBION WORKS, SALFORD,
LANCASHIRE.

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MANUFACTURERS OF
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FOR ENGINEERS,
STEEL OF ALL DESCRIPTIONS.
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And every Description of Gas Apparatus.

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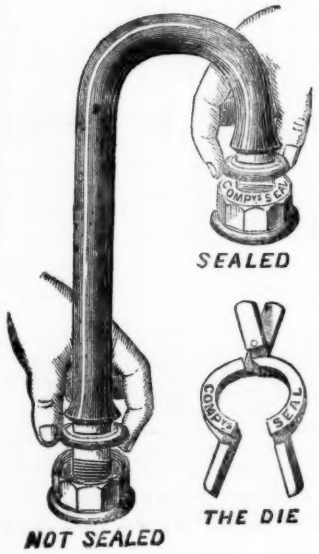
FOULGER'S PATENT
COUNTER-SUNK SEAL GAS-METER UNIONS,
As Supplied to The Gaslight and Coke Company.



These Unions practically place a Gas Company's property under lock and key, by rendering it impossible to disconnect at any joint at which gas could be obtained unregistered, without destroying the Company's seal or signature, whilst a small cover absolutely protects the impression from accidental injury.

A meter having been fixed with one of these Unions on the main-cock, and another on the inlet, a few pinches of specially prepared crushed sealing-wax is placed in the cup, and being melted with a blow-pipe, the wax runs between the reversed threads, the circular tong-shaped die will then give a sharp impression of the Gas Company's title, an operation requiring about two minutes in all to perform.

If heat is applied for the purpose of unsoldering the joints, the wax is instantly fused, and the impression, of course, lost.

Are supplied in all sizes, either as Caps and Linings or Barrel-Unions, and at a small additional cost over existing connections.

For further Particulars, Samples, &c., apply to the Sole Agents,

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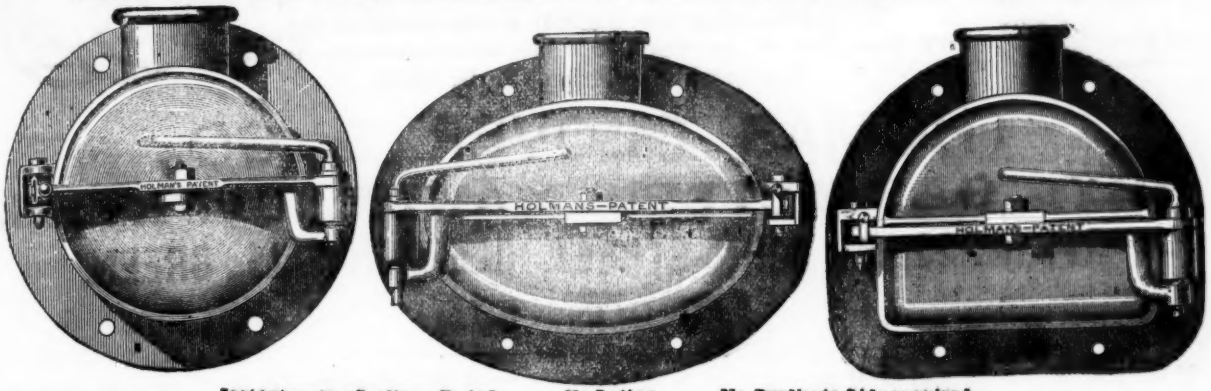
CORNWALL HOUSE, 35, QUEEN VICTORIA STREET, LONDON, E.C.,

(LATE OF 10, LAURENCE POUNTNEY LANE.)

SOLE MAKERS OF MORTON'S PATENT SELF-SEALING RETORT-LIDS,

WITH HOLMAN'S PATENT ECCENTRIC FASTENINGS,

Anti-Friction Catches, and New Self-Adjusting Cross-Bars.



Instantaneous Sealing effected. No Luting. No Duplicate Lids required.

Holman's New Self-Sustaining Cross-Bar ensures freedom of Joint, and maintains parallel position of the Lids.

Since their introduction in 1869, these Patent Retort-Lids have been thoroughly tested, being now in use in nearly all the principal Gas-Works in London and the Provinces.

T. B. and H. are now making the "Morton's Self-Sealing Lid" of the SAME FORM OR SECTION AS THE RETORT (see Illustrations above), as well as bringing the Mouthpiece from the D or Oval at back to Circular in front, as heretofore.

D and Oval Morton's Lids are working satisfactorily both in this country, on the Continent, and in the United States of America. Among others they have been adopted by the following Gas-Works:—

The Gaslight Company's Works, Fulham; Ditto, Bromley-by-Bow; Ditto, King's Cross; Ditto, Shoreditch.
And also in the Gas-Works at Richmond, Maidstone, Gloucester, Glasgow, Portsea, Roubaix (France), The Hague (Holland).

HUNT'S PATENT EQUILIBRIUM GAS-GOVERNOR.

In this Governor a Throttle-Valve is substituted for the ordinary suspended Cone, all external communications being avoided by placing the Lever or Radius Arm (shown in the drawing) inside the Valve-Chamber upon the Disc. The Disc is carried upon steel centres, upon which it is accurately balanced and turns freely. The friction in working is thereby reduced to a minimum. This Governor is extremely sensitive to alterations of inlet or outlet pressure, and renders a large actuating holder unnecessary.

The principal advantages of this arrangement over the ordinary form of Governor are as follows:—

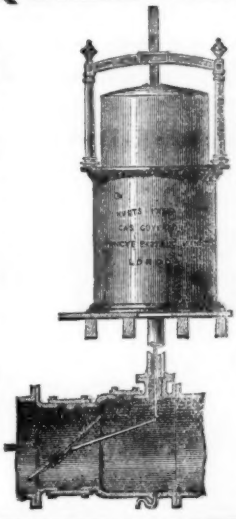
Its sensitive action prevents oscillation.

It is self-adjusting—*i.e.*, it maintains a steady pressure under variations of inlet pressure or a fluctuating consumption.

The inlet to Gasholder being contracted to the smallest possible dimensions, all danger from leakage through insufficiency of seal, tilting, &c., is entirely avoided.

The valve portion being separate from the holder, it can be handled and fixed like an ordinary Slide-Valve direct in the main; and the holder can be placed at an convenient distance immediately above it. The cost is thus materially reduced, and the inconvenience of heavy lifts done away with.

There are no working parts likely to get out of order.



These Governors have been adopted by many leading Gas Companies, among whom are the following:—

The Gaslight and Coke Co. (9), The London Gas Co. (3), and at Abergavenny, Arundel, Birmingham, Cannes (France), Devonport, Dursley, Exeter, Guernsey, Halesowen, Mentone (France), Monmouth, Newcastle-on-Tyne, Oxford, Plymouth, Rochdale, Windsor, &c.

TESTIMONIAL.

The Gaslight and Coke Company,
9, Water Street, New Bridge Street,
Blackfriars, E.C., Feb. 27, 1875.

MESSRS. TANGYE BROTHERS AND HOLMAN.

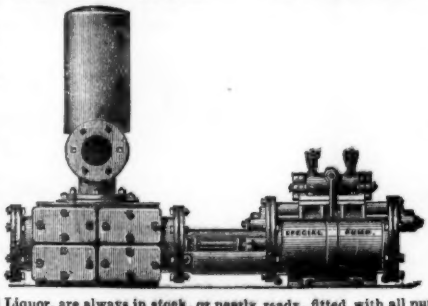
Gentlemen,—The two 24-inch and three 36-inch Hunt's Equilibrium Governors supplied by you, and fixed in the valve-rooms at Whitechapel, Goswell Road, and Blackfriars, are working very satisfactorily.

Yours truly,
(Signed) JOHN JOHNSON.

PRICES AND FULL PARTICULARS ON APPLICATION.

THE "SPECIAL" STEAM-PUMP.

Diameter of Steam Cylinder.	Diameter of Water Cylinder.	Length of Stroke.	Gallons of Water per Hour, Approximate.	Reduced Prices.
3	1½	9	450	£16
4	2	9	815	18
5*	2½	12	1,250*	21
5*	3	12	1,830*	22 10
4	4	12	3,250	25
6*	4	12	3,250*	30
5	5	12	5,070	32 10
7*	5	12	5,070*	40
6	6	12	7,330	40
8*	6	12	7,330*	50
7	7	12	9,750	50
10*	7	12	9,750*	65



In use in a Hundred Gas-Works in the United Kingdom for Pumping Ammoniacal Liquor, Water, or Tar.

Messrs. Burt, Boulton, and Haywood, Manufacturing Chemists, have over FORTY "Special" Steam-Pumps in use at their several large Tar-Works.

Two Hundred Sizes made. Those in Table opposite are the leading Sizes for use in Gas-Works and Chemical Works.

* These Sizes being usually selected for pumping Tar and Liquor, are always in stock, or nearly ready, fitted with all pump details in iron, and extra length distance-piece between steam and pump cylinder, at a small extra cost.

TANGYE'S HIGH-PRESSURE AND CONDENSING STEAM-ENGINES; CORNISH, VERTICAL, & TUBULAR BOILERS; HYDRAULIC AND SCREW LIFTING-JACKS, CRABS, PULLEY-BLOCKS, &c.

FULL PARTICULARS, ESTIMATES, CATALOGUES, ETC., ON APPLICATION.

London, 1851. New York. 1853. Paris, 1855. London, 1862.

Dublin, 1865.

The SIX MEDALS AWARDED to THOMAS GLOVER for

PATENT DRY GAS-METERS,

The latter being the Highest Medal awarded for Dry Gas-Meters bv the Imperial Commissioners for the Universal Exhibition, Paris, 1867.

Paris, 1867.

THOMAS GLOVER & CO.,

DRY GAS-METER MANUFACTURERS,

214 TO 222, ST. JOHN STREET, CLERKENWELL GREEN,

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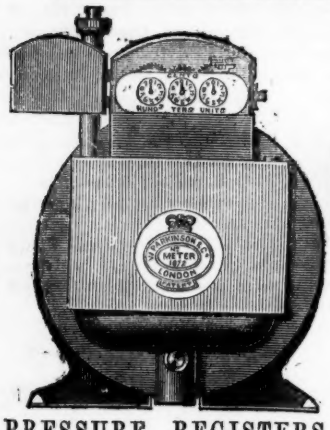
THOMAS GLOVER & CO.'S PATENT DRY GAS-METERS.

1st, Are a remedy for all the defects of Wet Meters;
2nd, Are suitable for all climates, whether hot or cold;
3rd, Incur no loss of Gas by evaporation;
4th, Cannot become fixed by frost, however severe;
5th, Are the most accurate and unvarying measurers of Gas;
6th, Prevent jumping or unexpected extinction of the Lights;
7th, May be fixed either above or below the level of the Lights;
8th, Cannot be tampered with, without visibly damaging the outer case;
9th, Will last much longer than Wet Meters;
10th, Will not cost more than one-half for repair that Wet or Water Meters do;
Are upheld for five years without charge.

WILLIAM PARKINSON AND CO.,



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MANUFACTURERS OF

WET & DRY METERS,

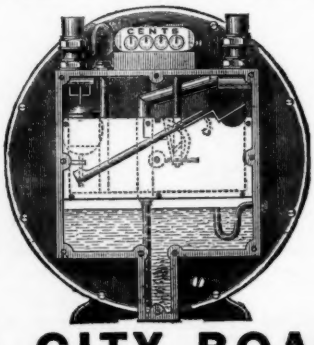
STATION-METERS & GOVERNORS,

EXHAUSTER REGULATORS,

PRESSURE REGISTERS, EXPERIMENTAL APPARATUS, GAUGES, WATER-METERS, &c.

HUNT'S PATENT IMPROVED COMPENSATING METER.

In this Meter, the action of the measuring-drum is reversed. By this arrangement an improvement is effected in the registration at high speeds, which, in many tests, has not varied from the smallest light to three times the capacity of the meter. It works equally well under all pressures. The range of error between the high and low line is much smaller than that allowed by the "Sale of Gas Act."



The Meter has been critically tested, and most favourably reported upon by official Meter Inspectors in London and Birmingham.

W. PARKINSON and CO. have made arrangements for the manufacture of these Meters, both in tin and cast-iron cases, and for the alteration of old ones to this principle, which is confidently recommended as possessing every quality that can be desired by Gas Companies, Corporations, or Private Consumers.

COTTAGE LANE, CITY ROAD, LONDON, E.C.

CONTENTS.

	PAGE
Circular to Gas Companies:—	
Report and Accounts of the South Metropolitan Gas Company	537
Meeting of the Commercial Gas Company	537
Meeting of the Phœnix Gas Company	537
Meeting of the Alliance and Dublin Gas Company	537
Meeting of the Sheffield United Gas Company	537
The Gas Accounts of the Corporation of Manchester	537
The Gas Accounts of the Corporation of Leicester	537
The Electric Light at the British Museum	537
Examinations in "Gas Manufacture"	538
Quarterly Report of the Chief Gas Examiner	538
Water and Sanitary Notes:—	
Agitation against the London Water Companies	538
The Social Science Congress	538
Failure of the Well-Boring Operations at Liverpool	538
A New Reservoir for Leeds	538
The Unsanitary Condition of Dublin	538
Leading Articles:—	
The Metropolitan Water Supply and River Conservancy	539
Suburban Sanitation	540
Communicated Article:—	
Sulphur in Coal Gas. By "Delta"	541
Correspondence:—	
The Manufacture of Sulphate of Ammonia	542
Miscellaneous News:—	
Metropolis Gas Supply	542
Metropolis Water Supply	542
Meeting of the East London Water-Works Company	542
South-West of England District Association of Gas Managers	542
North of England Gas Managers Association	542
Meeting of the Phœnix Gas Company	543
Meeting of the Commercial Gas Company	545
Social Science Congress	546
Manchester Corporation Gas Supply	547
Sale of Sevenoaks Gas Company's Shares	551
Darlington Corporation Gas Supply	551
Leicester Corporation Water Supply	551
Barff's Process for Preserving Iron from Rust	551
Meeting of the Alliance and Dublin Consumers Gas Company	552
Meeting of the Sheffield United Gas Company	553
Reduction in the Price of Gas at Plymouth	553
Reduction in the Price of Gas at Wexford	553
Alleged Pollution of the Sheffield Water Supply	553
Sale of Shares in the Bury St. Edmund's Gas Company	554
Leicester Corporation Gas Supply	554
The Electric Light	554
Leeds Corporation Water Supply	554
Failure of the Bootle Well-Boring Experiments at Liverpool	555
Trade Reports	555
Dukinfield, Denton, and Haughton Gas-Works	556
The Late Mr. Laming	556
Death of Mr. A. F. Livesay, of Ventnor	556
The Water Supply of Wakefield	556
Register of Patents:—	
Morgan-Brown, W.—Fluid-Meters	556
Lake, W. R.—Opening and Closing the Stopcocks of Gas-Pipes	556
Lake, W. R.—Water-Meters	556
Cougnet and Potel—Injecting, Exhausting, and Forcing Fluids	556
Applications for Letters Patent	556
Share List of Gas and Water Companies	557

TO CORRESPONDENTS.

No notice can be taken of anonymous communications. Whatever is intended for insertion, must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.

THE JOURNAL OF GAS LIGHTING,

WATER SUPPLY, & SANITARY IMPROVEMENT.

TUESDAY, OCTOBER 7, 1879.

Circular to Gas Companies.

We have received the report of the Directors and the accounts of the South Metropolitan Gas Company for the past half year, issued in anticipation of the meeting next Monday. They necessarily show a very prosperous state of affairs. The profits made allow of the continued payment of a dividend of eleven and a half per cent., leaving a balance to be carried forward. This is the last balance-sheet that will be issued by the South Metropolitan Company pure and simple. The amalgamation with the Surrey Consumers Company took effect as from the 1st of July last, so that in the next half-yearly statement we shall have the accounts of the United Company. The Directors draw attention to the large additions that are being made to the works—not, it is quite clear, too early, for in the course of the past half year there was the unprecedented increase of fourteen per cent. in consumption. We shall have occasion to recur to this prospe rous undertaking after the half-yearly meeting of Shareholders has been held.

The meetings of the Metropolitan Gas Companies which were held during last week, as a matter of course passed off satisfactorily. We notice the Commercial Company's meeting first, by virtue of its high dividend. The balance of revenue account for the past half year amounted to £37,528, and, after making necessary deductions, there was left a sum of £33,050 applicable to dividend. The price charged by the Company during the past half year was 3s. 5d. per thousand feet, their initial or standard price being 3s. 9d. Thus they were able to pay one per cent. over what used to be called maximum dividends, and accordingly a dividend of eleven per cent. was declared on the old stock, and eight per cent. on the new, leaving £2903 to carry forward. From Midsummer last the price of gas was reduced to 3s. 3d., which will allow the Company to pay one-half per cent. more next half year. The highly prosperous condition of the undertaking, with its large reserve, makes it seem probable that a higher dividend will speedily be reached.

The Phœnix Gaslight and Coke Company, whose report and accounts we noticed last week, held their meeting on Wednesday, and little transpired calling for notice, except that the question of amalgamation cropped up. On this subject the Chairman was somewhat reticent. He said that negotiations had been going on for some time, had failed, and had been re-opened. In what position they are at the present moment we cannot undertake to say, but we sincerely hope to find that before many months have passed the union of the Phœnix with the South Metropolitan Company is *un fait accompli;* and it is certain that the interests of all three Companies on the south side of the Thames will be so much promoted by combination, that every one connected with them must desire to see it speedily effected. There is, we believe, among consumers on the other side of the river but one wish, and that is to see the interests of the three Companies consolidated. Let us hope we shall soon hear that an amalgamation scheme has been prepared and laid before the Board of Trade.

We publish to-day the report of the half-yearly meeting of the Alliance and Dublin Consumers Gas Company, which shows how well satisfied the Shareholders are with the management of their property. We have little to add to what we said last week, except to express extreme gratification at the rapid increase in the Company's business. Those who are not acquainted with Dublin can hardly appreciate what is meant by the addition of three hundred and thirty-eight new customers in the course of a half year. The very considerable working capital which the Company now have will, we hope, enable them to commence at once their manufacture and sale of stoves and gas-engines of all kinds, which we are certain will bring a large addition to their business as gas makers, and, it may be, profit as metal workers and dealers.

The half-yearly meeting of the Sheffield United Gas Company was held on the 1st inst., when, as a matter of course, maximum dividends were declared on all classes of shares and stock, leaving a large balance, from which the reserve-fund has been filled up, the Company still having a cash balance of £18,072 left in hand. The reserve-fund, which is ten per cent. on the capital, amounts to £67,055, and thus is more than equal to a year's full dividend. With so much prosperity the Company can afford to be generous, and a further reduction in the price of gas was announced to take effect from the 30th of last month. The charge to the smallest consumer will now be 2s. 4d., and the largest 2s. per thousand feet. The consumption of gas increases so rapidly in Sheffield, that the Company are compelled again to add to their works, and happily have been able to secure an eligible piece of land in close contiguity to their present station in Effingham Street.

In the present number we give in full the report of the Gas Committee of the Manchester Corporation, together with the accounts for the past year. The circumstances of the Manchester gas undertaking are so peculiar, that we always hesitate to comment upon the results obtained further than this—always to protest against the appropriation of the profits of gas manufacture in relief of the rates. To this subject we have returned year after year, and year after year the Gas Committee have apportioned a large sum from gas profits in aid of public improvements. The year before last they set aside £51,000 for this purpose, which, as we remarked at the time, was simply taxing the gas consumers in aid of rates which ought to be paid by consumers and non-consumers alike.

Unlike Manchester, the Improvement Commissioners of which began making and distributing gas before the manufacture was perfected, and obtained their works practically for nothing, the Corporation of Leicester have bought a gas undertaking under modern legislation. Still, they have thus far done very well, and let us note this fact to the honour of the Corporation of Leicester, that with a comparatively small balance of profit in hand they reduce the price of gas. There seems, at the present moment, to be no idea entertained of making out of the gas consumers a profit in aid of the general rate.

The electric light is, we learn, about to be introduced into the British Museum. The reading-room and some of the galleries are to be illuminated by its agency. We do not at present hear of any further applications of the light, which is now perhaps a half-forgotten wonder. A paragraph,

which appears in another column, shows that in the year 1850 the light had reached about the same stage of perfection it has now attained, and then it seems to have been forgotten again, to be re-discovered nearly thirty years later. It is curious to note that Mr. Staite, the inventor of the light and lantern to which reference is made in the paragraph, in those days employed iridium, just as Mr. Edison proposes to do to-day.

We omitted last week to refer to the examinations in "Gas Manufacture" to be held in May next year by the "City and Guilds of London Institute for the Advance-"ment of Technical Education." The usefulness of these examinations is beyond all question. They stimulate exertion, and promote a spirit of emulation which is eminently conducive to further progress; we may say, not simply the progress of the science and art of gas manufacture, but of the successful competitors in these contests. We gave last week samples of the questions asked of the candidates this year, which required for satisfactory replies a tolerably intimate knowledge of the works of the old Great Central Company. Mr. A. Angus Croll is to be the Examiner, and he will, no doubt, ask the candidates some very practical questions. We would urge all who have time to study—and who has not?—to prepare for these examinations.

In another column will be found the report of the Chief Gas Examiner to the Metropolitan Board, on the results of the testings for the past quarter. It shows that the Companies carefully fulfil all their obligations. We notice in one or two instances a small deficiency in illuminating power, but so small that we may take it the Metropolitan Board of Works did not deem it necessary to institute any proceedings. As regards the "sulphur" impurity, it is a noticeable fact that the Instructions of the Referees have been strictly complied with at all the stations of the Companies. Ammonia was always present in the gas sent out, but not in excess of the amount allowed by the Referees.

Water and Sanitary Notes.

AGITATION on the Metropolitan Water Question still continues, and some people, who have evidently not kept up with the current of events, are recommending that a conference of Vestrymen should be held, this one, at all events, to get the water undertakings assigned to the Metropolitan Board of Works. A report has gone abroad that the Home Secretary has prepared a Bill to effect the purchase of the Metropolitan Water Companies. The truth or falsehood of this story will be made manifest next year, when Parliament meets for domestic legislation. It may be, however, that the whole matter will be relegated to a new Parliament, and everybody knows what that means. In the first session of a new Parliament very little is done in the way of domestic legislation, unless the Legislature is called together to settle some "burning" question.

The Metropolitan water business, urgent as some people profess to believe it, is not a "burning" question, and will, no doubt, be allowed to stand over, probably for the next three years. In the meantime, the Metropolis will continue to be supplied with excellent water, and will remain the healthiest large city in the world. We notice that the week before last the average death-rate was only seventeen per thousand—a rate almost unexampled in Metropolitan sanitary history. This may not say much in favour of the water supply, but it shows clearly enough that no pernicious influence can be exercised by what is an article of such large consumption. Londoners would, in fact, remain perfectly contented with their water if a small knot of agitators did not constantly endeavour to persuade them that they were being slowly poisoned by it.

The National Association for the Promotion of Social Science, which met at Manchester last week, had the good fortune to have for its President the Bishop of the diocese—Dr. Fraser. This prelate is well known for the outspoken common-sense manner in which he is in the habit of dealing with all social questions. At the Congress he was perfectly at home, treating of a variety of subjects with great ability and earnestness. What is really one of the most important matters at the present time is the means of disposing of our dead. The cemetery question becomes a more pressing one every day, and in the Metropolis the subject will presently have to be dealt with in a very summary way. With differences, the same condition of things obtains in the neighbourhood of every crowded city and town in the country. The remedy which Dr. Fraser points out is the adoption of the practice of cremation; but against this the majority of English people exhibit an invincible repugnance. However, to something of this kind it must come, if we are not to bury five deep in one grave, as they do in some London cemeteries, and are unable to stir an inch of soil without letting loose some foul effluvium. Passing to more savoury matters, Dr. Fraser pointed out the conditions necessary to health, and, among other things, did valuable service by showing the fallacy of averages. We read, for example, that a fortnight ago the average death-rate in London was seventeen per thousand, but in all probability the differences which made up this average were almost as large as those stated by Dr. Fraser in Manchester. It will be impossible to effect any great sanitary changes until the public are aware of how many people die in Seven Dials and the back slums of Bethnal Green, as compared with the high districts of Highgate and Brixton. These facts being known, the health of our poorer population will perhaps receive more attention. The treatment of sewage was another subject dwelt upon by Dr. Fraser. This is a very important matter. Whether the chemical treatment which Dr. Fraser appears to advocate is the best that can be adopted by all large towns, or whether sewage farms are more remunerative, we shall not here pretend to say; it will take a generation or two to settle the question. One thing we may remark astonishes us, and that is a statement by Dr. Fraser that by General Scott's process a precipitate can be obtained which will contain five per cent. of ammonia and twenty per cent. of phosphates. We have had a great deal to do with sewage precipitates, but never in our experience came across one like this. If the Corporation of Manchester can manufacture a manure of this quality by the chemical treatment of their sewage, we recommend them to adopt Scott's system at once. Another thing to which Dr. Fraser called attention, with reference to sewage schemes and other improvement measures, was the enormous expenses to which Local Authorities are put in acquiring land. They are almost invariably opposed by the large landowners in the vicinity of their proposed works. We had an illustration of this in the case of the Lower Thames Valley Main Sewerage Scheme at Molesey, and Manchester was nearly losing the Thirlmere Water Scheme. The fact is that before long some tribunal other than a Parliamentary Committee must be invented to get a Bill through its initial stages, and sooner or later changes will have to be made in the Standing Orders.

At last it is confessed that the deep boring of the Bootle well at Liverpool has proved a failure. It is true that more water is obtained than was procured before the deep boring was commenced; but it is ascertained that this additional supply comes from two sources—one from the old well, the level of which sinks just as the pumping of the new well is increased, and the other is apparently an influx of water from the Mersey. All this is exactly what was prophesied, and now there is no alternative but for the Corporation to push on as rapidly as possible with the preparation of the Vyrnwy scheme, which we hope they will carry in the next session. Alderman Bennett must get over his disappointment as best he can.

The Corporation of Leeds have just entered upon a very large addition to their water storeage. The new reservoir at Eccup, commenced yesterday week, is calculated to hold 1400 million gallons of water, which is sufficient for twenty weeks consumption in Leeds. Upon the completion of this reservoir, Leeds will be provided with a supply of water for fifteen months, the total estimated storeage capacity being 3970 millions of gallons. An ingenious member of the Corporation has calculated that this quantity would be sufficient to supply with a gallon of water every man, woman, and child upon the face of the earth.

That underneath the older parts of our city lies a pestilent mass, which is always calculated to engender disease, is unfortunately too well known; but the difficulty is to get it removed. In Dublin, things appear to be much worse, for there they have not the complete system of drainage which we enjoy. As our readers were informed some short time since, a Commission was about to sit in Dublin, to investigate the causes of the excessive rates of mortality in that city. The investigation began on Tuesday last, and the first revelations were startling. Mr. R. Rawlinson, C.B., one of the Commissioners, stated that even the better parts of Dublin were honeycombed with cesspools, over which the dwellings are built. But there will be no difficulty in finding out the causes of the high death-rate in Dublin; in truth, there is to be found in the city everything that is abominable in the eyes of sanitarians. Overcrowding and filth in houses, want of drainage, and last, but not least, bad paving. These are only a few of the evils which, coupled with the habits of the people, contribute to the unhealthiness

of Dublin. We refer to it here mainly to call attention to the want of proper returns of death-rates in different localities. In Dublin, for example, we find the average density of the population to be 65 per acre; but in some parts it rises to as many as 242 per acre. Of course, the death-rate would be assessed upon the general average, and a most fallacious conclusion would be arrived at. We have no need to go so far as Dublin for illustrations; we have them in our midst, and wait with anxiety to see them removed.

THE METROPOLITAN WATER SUPPLY AND RIVER CONSERVANCY.

In an article on "The Government and the Metropolitan "Water Companies," last week, we alluded to the question of River Conservancy. This is a matter of unquestionable importance as connected with water supply from the Thames; and although there is no doubt that the published analyses of the water entering or issuing from the Companies mains must always be referred to in all public investigations, it is equally certain that the history of the water will have, and ought to have great consideration from sanitary authorities, before deciding that the Thames is a proper source of supply. If the history of the water is reasonably satisfactory, the analysis favourable, the health of the Metropolis good, and the death-rate low, we may be allowed to put aside, as of no practical importance, the slight discoloration only recognized by the two-foot tube, or even the microscopic indications of organic life. The former, after all, are only the last remains of the muddiness of flood water, and the latter the food of fishes, which are, it is believed, returning to inhabit the Thames, rather as an indication of improvement than of pollution.

The history of the water conveyed by a river commences with the birth of the stream. In the lower part of its course, as in the late history of a civilized country, the original parentage not only has to be traced from far, but must be looked for from many sources, and over a very wide area. The river is made up of tributaries, and the tributaries themselves have many feeders, the original sources of which are sometimes at a great distance from the one regarded as the principal. In the Thames, as in other rivers, the feeders are many, and their sources divergent; but, unlike other rivers, they are grouped naturally, and an upper basin is formed, which a very slight change in the physical features would convert into a large lake having no other communication with the rest of the river than an overfall into the lower basin by the gorge near Pangbourne.* There are simple geological reasons for this condition, with which we need not trouble our readers; but the fact is important, for as there is no possibility of any pollution from the upper basin and its feeders, beyond that which has entered above this gorge, the stream as it issues from it may be regarded as the starting point for all comparisons and investigations as to its state at any other point lower down the stream. There is no doubt that the water in this part of the river is at all times, except during heavy flood, altogether unexceptionable. The flow of the river below Abingdon has been sufficient to remove any evil effect of the upper towns and of those on the River Thames, so far as can be detected by analysis, and the water as it passes Wallingford is a pure, clear, beautiful stream of unexceptionable excellence.

So far as actual and determinable purity is concerned, the water is certainly as good on emerging from the Pangbourne gorge as any that could be obtained, and the Thames Conservators might safely make this a standard. But it is not so below. Several streams enter the Thames between this point and Hampton, where the waters are taken; and of these some certainly require looking after. The Kennet, the Loddon, and the Tittlebourne Brook form a group of streams draining a large district to the west, and joining the Thames at Reading. They pass three or four large towns in the early part of their course, but, according to Dr. Frankland's analyses in the Sixth Report of the Rivers Pollution Commissioners, the quality of the water as it enters the Thames is decidedly better than that of the Thames itself above Reading, and is indeed about equal to that of the sources of the Thames. It is not so, however, with the other rivers, the Wick, the Colne, the Bourne Brook, the Wey, the Mole, and the Wandle. Most of these streams are utilized by manufacturers, and receive manufacturers waste, which is by no means harmless, especially in the case of paper makers.

It is evident that, to be of any use for the preservation of the quality of Thames water, the Conservators should not only have power to inspect these streams, but to insist on the exclusion from their waters of all waste likely to be injurious. Such power is not at present entrusted to them, nor was it even proposed to be entrusted by the Bill brought in, but not proceeded with in the last session of Parliament. There are, no doubt, many duties to be performed by the Conservators, but it is not easy to see the use of River Conservancy if it does not confer power to inspect, to discover nuisances, and to remove them. It, however, needs not only the power, but the will to do these things, and this is dependent on the constitution of the Board. This, therefore, requires careful attention and consideration; and here, also, we must be permitted to doubt if the plan proposed was likely to answer the purpose and ensure the improvement that is both possible and desirable.

Assuming—which may safely be done—that the Thames water above Pangbourne is always irreproachable, it may be suggested that a supply might be obtained from thence, the river below being left to the manufacturers. In this way a water would be obtained which in the latter part of the summer might be superior in quality to the water now supplied, and be delivered at all levels in London without pumping. The conditions are favourable for the construction of very large storeage reservoirs in this part of the stream; and if the reservoirs were sufficiently large, so much of the flood waters might be stored as to enable compensation to be given, and the flow of the whole stream below the reservoirs to some extent regulated. That these reservoirs could greatly diminish floods in the Lower Thames is, however, not likely, as they would generally be full, and the extra flow during floods hardly reduced. If such a scheme should ever be carried out, the work of the Conservators would be lessened; but till then it seems clear that a very essential part of their duty should be to preserve the purity of the stream by active and minute inquiry concerning all the tributaries, as well as investigations as to the drainage of the great towns on the stream.

It would not be difficult to prove that, endowed with larger powers, having larger views, and introducing something of the scientific element into their present system, the Conservators of the Thames might ensure for London water superior to that with which it is now supplied. This is a remedy which has hitherto attracted very little attention, for those who find fault with the Thames as a source of supply have generally assumed that no improvement could be expected in the quality of the Thames water. It has been our object to show that this is not the case. All admit that the sources of the Thames are remarkably pure, bright, and excellent in all respects. The injury done to the water by the various feeders in its early course—which, originating in some cases near large towns within the Thames basin, appear to be subjected to the evil influences of their populations—is, in point of fact, *nil*. The water, after it has travelled nearly a hundred miles in the main channel, and received a dozen tributaries, is still as good and pure as when it first began its course, and it could be delivered in this state. Below this point occurs whatever is objectionable, and in this part of its course the efforts of Conservators might well be exerted to prevent all possible admission of evil influences. Even without this help the water is generally excellent—only occasionally objectionable—in time of flood, and with it there would probably be little, if any, cause of offence, certainly none that would not be removable by deposit and filtration.

There is, then, a definite work to be performed, in which the Companies have no power to move, and which it devolves on the Central Government to initiate. So far as the Thames is concerned, there is a Conservancy Board, but with limited powers, and ill constituted to carry out the work of the purification of the stream. No doubt the Board have done much, even in this respect; and, from a report prepared last year, it is clear that, so far as the towns on the banks are concerned, there is not much left to do. But it is not so as regards the tributaries. These especially need consideration, as on their condition depends the purity of the river. If the Thames water is to be used in the best possible state, it should either be taken from above Pangbourne, or the Board of Conservators should be empowered and enjoined to see to the condition of all the streams that enter the river between Pangbourne and Hampton. It is a definite and important undertaking, and could not be effected without a constant reference to analysis, and constant inspection by competent observers. For this, parliamentary powers are required, and it should be a work carried on quite independently of the Companies, for the Thames is not valuable alone as a source of supply for the Metropolis, but its purity affects the health and comfort of many other important towns.

* The facts and conditions here mentioned are clearly stated and explained in the volume on "Water and Water Supply," by Professor Ansted, recently published. The account of the River Thames will be found very instructive to those interested in water supply.

SUBURBAN SANITATION.

Among the sanitary questions propounded at the Social Science Congress last week was one by Mr. Alfred Haviland, of Northampton, to the following effect:—"What are the "evils resulting to health from the growth outside the boun- "daries of Municipalities of suburban districts without due "regulation and control?" Mr. Haviland considered that there ought to be no distinction between urban and rural sanitary districts. He would have the same law for town and country in regard to sanitary matters, for he considered that the rural authorities needed the same powers as the urban. The object which Mr. Haviland avowedly had in view was that of having a more thorough inspection of the rural districts, involving therefore the appointment of more inspectors. But this proposal to place town and country under one law evidently grew out of a consideration of the evils connected with the growth of populous suburbs. The isolated village was not so much thought of as the "outer "ring" which attaches itself to all large towns. The fact of thousands of people living under a very lax system of sanitary law, close to a large population enjoying the full benefit of municipal rule, is felt as an anomaly. A sort of sanitary Alsatia encompasses the would-be Hygeia. To bring the former under proper control, Mr. Haviland, and some others who discussed the question, would have the sanitary regulations to be the same throughout city and suburbs. To gain this end, they would have the same law extended over the whole kingdom—city and town, suburb and village.

It would require a careful study of the Public Health Act to see how far this system would be likely to work satisfactorily. We should expect to find that this rough-and-ready mode of dealing with the subject could not be carried out. Certain trades are prohibited in towns, which must nevertheless be carried on somewhere. The keeping of pigs could not be tolerated in the City of London, but pigs must nevertheless be allowed to exist. The real principle at stake seems to be that of extending a municipality according to the growth of the population. Instead of limiting the municipal functions to a given area of land, they should be spread out with the extension of the houses. It was the fallacy of our forefathers to suppose that they could set bounds to London. They built up walls, as if they could fix for all time what should be the extent of the British capital. At this date London was about a mile square. One side of Temple Bar was London, and the other side a mere suburb. As the years passed on, people built houses outside London, and a population of vast extent began to encircle the municipal area. Still the Lord Mayor, Aldermen, and Councillors, considered that nothing was London that did not lie within the lines that had been drawn in some remote period of the past. No revision of the boundaries had been provided for, and the only concession was the recognition of certain "liberties" and wards "without." The same process is going on still, both in respect to London and a large proportion of the provincial towns, with results which are too embarrassing to be disregarded, though the proper mode of meeting the difficulty has not as yet been clearly apprehended.

That the subject present to the minds of those who heard Mr. Haviland's paper at Manchester was the condition of the suburban rather than the strictly rural districts, is shown by the terms of the resolution adopted by the audience. It was resolved—"That this meeting recommends the Council to "memorialize the Government that, in order to lessen the "evils resulting to health from the growth of suburban dis- "tricts outside the boundaries of Municipalities, powers be "obtained to bring both the municipal area and the suburban "district under the control of one sanitary authority." In London we have an example of something which resembles this, but in some respects there is a difference. The Corporation have been left to the enjoyment of their dignities and their property; but the Metropolitan Board have been constituted to take charge of the populated area which surrounds the City, and also to construct works of main drainage for the whole of London, including the civic area. An arrangement somewhat of this nature seems to be contemplated by the Social Science resolution. The town, both outside and inside the walls, is to be under one sanitary authority, but the town within the walls is to enjoy its municipal privileges as before, undisturbed by any application of these to a wider area. Municipal Authorities seem to be very jealous of their boundaries. They will neither consent to extension nor contraction. But the world cannot be expected to stand still, and it happens that the growth of the population sets at defiance those artificial restrictions which define a city or a town according to its ancient proportions.

The settlement of this question depends very much on whether we look at the people themselves, or the land they dwell upon. Are we to deal with a community, or with the people who happen to live between certain lines? We all know by this time that Regent Street is as truly in London as Ludgate Hill. For sanitary purposes we have extended the western boundary of the Metropolis as far as Hammersmith. But eastward we stop at the River Lea, with an enormous population just across that narrow stream. In the south we call Lewisham—still very like a village—part of London, and in the north we include Hackney. Having gone so far, we are yet told of an "outer ring," with a population of nine hundred thousand. Looking at the places which constitute this belt, we confess that some of them seem scarcely to belong to the London of the present day, while others ought really to be included. Croydon, we should hope, could take care of itself, and also Uxbridge, together with Bromley in Kent and Enfield. But the question after all is not so much whether certain outlying places should be included in the sanitary government of the Metropolis, as whether their exclusion is likely to leave them without proper sanitary control. On examining the statistics furnished by the Registrar-General, we fail to see any special unhealthiness in the outer ring. The mortality of that region a week ago was only at the rate of 13·0 per thousand living, while what is called "Inner London" had a death-rate of 17·2, the average for the combined area being 16·3. So also the death-rate from seven zymotic diseases was 2·2 in the outer ring, and 3·4 in inner London, the average being 3·2. Of course, density of population is hurtful to health, and in this respect many parts of inner London are placed at a serious disadvantage. Still, it would be difficult to prove from these figures that the outer ring would receive any direct sanitary benefit from being placed under the wing of the Metropolitan Board. West Ham has probably been prejudiced by its unnatural exclusion from the Metropolitan area, the disposal of its sewage having been a matter of extreme difficulty. So also there seems to be something chaotic in the dilemma of the towns which skirt the Thames on the western boundary of the Metropolis below the intakes of the London Water Companies. What these are to do with their sewage seems yet an unsolved problem, despite all attempts at a settlement.

The suburbs of many provincial towns occupy a position somewhat different from that of the Metropolitan outer circle. London had its boundaries extended, for sanitary purposes, little more than twenty years ago. Many of our provincial towns have the same jurisdiction which they possessed in the days of Elizabeth. Hence the necessity arises for some change of system. When the Public Health Act was framed, it was apparently supposed that every place must either be urban or rural. It was not considered that sundry places would occupy an intermediate position between the town and the country, so as to possess something of the qualities of both. To be complete, the districts specified should have been not only the urban and the rural, but also that anomalous and often unhappy class—the suburban. The discussion at Manchester is notable for its assumption that towns enjoy "proper "sanitary arrangements," while rural districts do not. As the law has left the suburbs in the condition of the rural, it is deemed that the suburbs of our large towns are in need of better care. Dr. Hardwicke, Coroner for Middlesex, taking part in the discussion on Mr. Haviland's paper, stated that it was a popular error for working men to suppose that living in the country was so much more beneficial than living in large towns. Yet we are inclined to think that the working man is not altogether wrong. Density of population is the curse of the poorer quarters of our large towns, and sanitary legislation has not yet provided an effective remedy for this evil. The Artizans and Labourers Dwellings Act is supposed to deal with the question of overcrowding; but while a certain number of families are rescued from the throng, overcrowding still exists, and threatens to increase. The overflow population of the agricultural districts precipitates itself on the towns, and poverty leads to close quarters.

The Bishop of Manchester, in his Inaugural Address at the Social Science Congress, made a fair hit when he spoke of "the fallacy of averages." Towns show a good average mortality, but they often exhibit bad results in particular spots. Sanitary regulations have reduced the death-rate of Manchester and Salford, so that it does not now exceed twenty or twenty-two per thousand under normal circumstances. But this comparatively low mortality is an average between ten or twelve per thousand in the best part of the area, and sixty or seventy in the courts and alleys. The working man cannot afford to live in the best parts, and hence to him the village may be healthier than the town. Villages may be wretchedly drained, and the water supply may be none of the

best; the dwellings themselves may be cramped, and even over-crowded; but Heaven's free air and pure sunlight surround the dwelling, and there is no labyrinth of dingy streets and alleys to exclude the invigorating breeze. Dr. Hardwicke states that in many country places the sanitary conditions under which the people are forced to live expose them to evils far worse than are to be met with in large towns where proper sanitary arrangements are in operation. Unfortunately, these "proper sanitary arrangements" often stop short at a certain point, and fail to give the poor man a healthful dwelling, owing to the fact that the houses stand so close together, and people are herded in such masses that the air becomes vitiated and rendered unwholesome through lack of what we may designate "town ventilation."

Dr. Farr discusses this question in a letter which he has addressed to the Registrar-General on "The Causes of Death "in England and Wales." He undertakes to demonstrate the law that "proximity and shortness of life go together." "The question," he says, "is one of the highest importance "to England," seeing that "every town is surrounded by circles "of new houses; and at every census villages are found grown "into new towns." This principle, taken by itself, would lead to the conclusion that the mortality of the English population must become greater every year. That this is not the case, Dr. Farr states, is due to a "countervailing law"—namely, the effect of those sanitary improvements which have accompanied the growth of our towns and cities. We may, therefore, apprehend how great is the evil if scattered suburbs are allowed to condense into populous quarters without the introduction of those sanitary arrangements which are proper to urban districts. Mr. F. S. Powell, the President of the Health Department of the Social Science Congress this year, in his Inaugural Address on Saturday, pointed out that the urban population of England, although largely increasing, shows a decreased mortality. But we must still remember the acute criticism of the Bishop of Manchester on the subject of the average. Special attention should be directed to those localities where houses are rapidly covering the ground, threatening to create new centres of disease in place of those which have been conquered elsewhere. An unhealthy suburb is like a subtle enemy encamped outside the walls, ever ready to enter the city and destroy the lives of its inhabitants.

Communicated Article.

SULPHUR IN COAL GAS.

By "DELTA."

(*Continued from p.* 506.)

Crude coal gas as it leaves the retort contains sulphur in combination with hydrogen as hydrogen sulphide, in combination with carbon as carbon bisulphide, in combination with carbon and nitrogen (cyanogen) as sulpho-cyanogen, and in combination with carbon and hydrogen as sulphuretted hydrocarbons, which have not, as yet, been isolated and examined. The small portion of oxygenated sulphur which leaves the retorts is neutralized and fixed by the ammoniacal liquor through which the gases bubble on entering the hydraulic main.

Disregarding, for the present, the sulpho-cyanides and unidentified sulphuretted hydrocarbons, it is found that, in round numbers, nine-tenths of the sulphur in crude gas exist as hydrogen sulphide. The affinity of hydrogen for sulphur is greater than that of carbon for sulphur, and when the sulphur is liberated from the pyrites in presence of these two elements, at a temperature sufficiently high for chemical union to take place, it divides itself between the claimants in a ratio which is a function of their chemical affinities for it, and of the amounts of them present. It may be that the time during which the gases are maintained at a temperature sufficiently high for chemical affinity to exert itself is not long enough to establish definite equilibrium between the sulphides of hydrogen and carbon, and that a longer heating in the retort would alter the ratio in which they are found in the cooled gas. At all events, it is certain that, when the crude gas is re-heated after it has left the retort, the proportion of hydrogen sulphide is increased, and that of carbon bisulphide diminished. In this case, the conditions under which the sulphur divided itself in the retort are changed; heated hydrogen is present in excess, heated carbon is absent. An equilibrium is reached much in favour of the hydrogen compound, for the carbon present, besides being much less in quantity than in the retort, is now united with hydrogen, and possesses, in such combination, less affinity for sulphur than when it is in the free state as heated coke. When crude gas is heated to a temperature so high that the gaseous hydrocarbons are partly decomposed, and a deposit of carbon is formed, the sulphide of carbon is less and less converted into hydrogen sulphide as the layer of heated carbon becomes larger. From these reactions it appears that, were it possible to heat crude coal gas without causing a carbonaceous deposit, the amount of hydrogen sulphide would be increased at the expense of the carbon bisulphide until an equilibrium was established such that, for gas of the same general composition, the proportion of sulphur as carbon bisulphide would bear a constant proportion to the sulphur as hydrogen sulphide. Accordingly, were the hydrogen sulphide removed between each heating, the carbon bisulphide could, practically, be completely removed from the gas in the form of hydrogen sulphide, by heating the gas and absorbing the hydrogen sulphide so formed several times in succession.

Although such experiments have been successfully conducted in the laboratory, and the amount of sulphur as bisulphide (after a preliminary purification from hydrogen sulphide) reduced by one heating from 30 to 5 or 6 grains in 100 cubic feet, the process has nevertheless not been worked on a large scale in gas manufacture.

In practice, the gases evolved from the retorts are cooled down as quickly as possible, and purification from sulphur compounds conducted in the cold by absorption with wet or dry reagents. Clegg was the first to purify coal gas from sulphur by putting lime in the water of his gasholder, and causing the crude gas to bubble through the "cream." By stirring the liquid up from time to time, Clegg succeeded in extracting the hydrogen sulphide from the gas, but the difficulty experienced in removing the foul lime from the large tank led him to adopt a separate wet lime purifier through which the gas passed on its way to the holder. The great pressure necessary to drive the gas through the liquid holding lime in suspension led to the adoption of dry lime purifiers at most gas-works, although some London Companies, like the Phœnix and Great Central, kept to the wet process as requiring less labour.

The introduction of the oxide process caused a revolution in gas purification. It is foreign to my purpose to discuss the rival claims of inventors, but from about the year 1850 purification by means of peroxide of iron came into general use. For some years previously, solutions of iron salts, and those of other metals, had been employed in gas-works with other chemicals as purifying agents. For instance, at the Great Central Company's works the crude gas was passed through a solution of manganese chloride to absorb hydrogen sulphide, and then through wet lime purifiers to catch carbonic acid and any traces of hydrogen sulphide which escaped the manganese. At some works the gas was sent through coke scrubbers, then through oxide of iron, and finally through dry lime; while at other works the gas was passed through lime and then through oxide of iron, although the important part played by the foul lime (calcium sulphide) in arresting bisulphide of carbon was then unknown, and the presence of that vapour itself disregarded, and that of other compounds of sulphur unsuspected.

The oxide of iron was prepared in different ways. Laming's oxide was made by precipitating a solution of iron sulphate with lime, forming a mixture of protoxide of iron and sulphate of lime. This was mixed with sawdust, the protoxide being quickly changed to peroxide by the action of the air. Another method was to soak sawdust with a solution of calcium chloride, and mix the mass with iron peroxide. In all the oxide processes the object was to absorb the hydrogen sulphide by means of the iron, and to fix the ammonium carbonate by double decomposition with the lime salt:—

Fe_2O_3	+	$3\,H_2S$	=	$2\,FeS$	+	$3\,H_2O$	+	S
Iron Peroxide.		Hydrogen Sulphide.		Iron Protosulphide.		Water.		Sulphur.

$(H_4N)_2\,CO_3$	+	$CaSO_4$	=	$(H_4N)_2\,SO_4$	+	$CaCO_3$
Ammonium Carbonate.		Calcium Sulphate.		Ammonium Sulphate		Calcium Carbonate.

The quantity of ammonia present, even after the decomposition of the ammonium sulphide in the gas by the iron, being insufficient to combine with all the carbonic acid, and so, by double decomposition, enable the latter to be fixed by the calcium salt, a large proportion of the carbonic acid passed through the mixture, and it was necessary to add a lime purifier to free the gas from this impurity.

The reaction by which iron peroxide absorbs hydrogen sulphide does not appear to be a simple one. By passing hydrogen sulphide over hydrated iron peroxide at ordinary temperatures hydrated sesquisulphide is formed:

$$Fe_2O_3 + 3\,H_2S = Fe_2S_3 + 3\,H_2O$$

This sesquisulphide, like the protosulphide, is decomposed by strong acids, giving off hydrogen sulphide, and on exposure to air is readily oxidized into the peroxide, with deposition of sulphur. In the oxide purifier both these reactions take place, the ultimate product depending on the temperature and quantity of hydrogen sulphide to be absorbed.

The revivification of the sulphuretted iron was the important part of the oxide process. Several patents were taken out for effecting this purpose. One was to roast the spent material, and so drive off the sulphur and recover the peroxide; another was to drive air through until the sulphide deposited its sulphur in the free state, and took up its original quantity of oxygen. The first process was too costly; the second caused the mass to heat up until the sulphur melted and clogged the pores so that the gas could not be forced through it. Luckily it was discovered that the spent oxide recovered its purifying properties by mere exposure to air, and could be used and revivified again and again until its mass was nearly doubled by the deposit of free sulphur. This important property of peroxide of iron caused its general adoption. Little nuisance is caused by its exposure to air, for, unlike calcium sulphide, it is not decomposed by carbonic acid. Moreover, when charged with sulphur, spent oxide commanded a large price, and, although the price has greatly fallen, owing to the failure of the schemes for economically abstracting the soluble salts and the sulphur from the material, it still finds a ready sale with the manufacturers of sulphuric acid. For the removal of hydrogen sulphide from coal gas no better reagent is desired.

Until the announcement by Dr. Letheby of the "other sulphur compounds" in coal gas revived the outcry against sulphur, the public were satisfied with gas free from hydrogen sulphide, and the mind of the gas manager was at peace.

(*To be continued.*)

Correspondence.

[We do not hold ourselves responsible for the opinions expressed by Correspondents.]

THE MANUFACTURE OF SULPHATE OF AMMONIA.

SIR,—I shall feel much obliged if any manager of gas-works, where they manufacture their own sulphate of ammonia, will kindly tell me what is found to be an average yield of the salt per ton of coal (or how many tons of coal it takes to yield one ton of sulphate); what the average price is at which it can be disposed of per ton; and what is the cost of manufacture per ton.

A GAS DIRECTOR.

Miscellaneous News.

METROPOLIS GAS SUPPLY.

The following is an extract from the report of Dr. Williamson, F.R.S., Chief Gas Examiner to the Metropolitan Board of Works, for the quarter ending the 30th of September:—

I. *With respect to Illuminating Power.*—The maximum, minimum, and average illuminating power in standard sperm candles were as follows—

	Max.	Min.	Aver.
The Gaslight and Coke Company—			
Beckton (common gas)	17·9	16·7	17·2
Friendly Place ,,	17·4	16·5	16·9
Millbank Street (cannel gas)	23·3	20·1	21·4
Camden Street (common gas)	19·7	16·2	17·6
Ladbroke Grove ,,	18·3	16·0	17·3
Carlyle Square ,,	17·2	16·0	16·6
Graham Road ,,	18·9	16·3	17·3
Devon's Road ,,	18·1	16·6	17·4
Commercial Gas Company—			
Parnell Road (common gas)	18·3	16·1	17·3
Wellclose Square ,,	18·2	15·6	17·1
South Metropolitan Gas Company—			
Hill Street (common gas)	18·5	15·9	16·8

From these results it will be seen that the average illuminating power for the past quarter at all the stations of the three Companies has been above the requirements of the Acts of Parliament, especially at the Beckton, Millbank Street, Camden Street, Ladbroke Grove, Graham Road, and the Devon's Road stations of The Gaslight and Coke Company, and the two stations of the Commercial Gas Company.

II. *As regards Purity.*—Sulphuretted hydrogen has not been present in the gas at any of the stations. Impurity in other forms than this was as follows:—

Grains of Sulphur per 100 Cubic Feet of Gas.

	Max.	Min.	Aver.
The Gaslight and Coke Company—			
Beckton	13·8	7·0	10·1
Friendly Place	14·6	7·3	11·4
Millbank Street	16·2	7·5	11·1
Camden Street	16·2	9·6	12·5
Ladbroke Grove	17·2	8·5	10·9
Carlyle Square	17·4	8·5	13·3
Graham Road	16·3	8·2	12·9
Devon's Road	18·5	8·0	12·0
Commercial Gas Company—			
Parnell Road	16·7	7·4	10·1
Wellclose Square	17·5	6·3	10·2
South Metropolitan Gas Company—			
Hill Street	15·3	5·2	9·0

It will be seen from these results that, with regard to sulphur, the average for the quarter has been at all the stations below the limits fixed by the Act of Parliament.

Ammonia has been present at all of the stations of the three Companies to a slight extent during the quarter. The average in each case is considerably below the parliamentary limit.

The Carlyle Square station of The Gaslight and Coke Company has been closed for repairs since the 14th of August.

THE AVERAGE METER SYSTEM IN ST. GEORGE'S, HANOVER SQUARE.—The annual report of the Surveyor of the Vestry of St. George's, Hanover Square (Mr. G. Livingstone, C.E.), states that the gas for the street lighting of the parish is supplied by The Gaslight and Coke Company and the London Gas Company, on the average meter system. The Vestry's own workmen do the lighting, cleansing, and repairs. The first cost of fixing the meters, &c., was £1711. The new system was commenced in June, 1877, and the cost for the year ending June, was: Gas £3985; lighting, painting, repairs, &c., £1680; maintenance of meters, governors, &c., £132—a total of £5798. From this must be deducted, for goods in stock and other credits, £155, making the net cost £5643. In the previous year, under the same system, the cost was £5724. Under the old system the Vestry paid the Gas Companies, in 1875, £6390 for lighting, &c., 1725 lamps, and the same amount in 1876.

METROPOLIS WATER SUPPLY.

The following are the returns of the Society of Medical Officers of Health on the Composition and Quality of the Metropolitan Waters in September:—

NAMES OF WATER COMPANIES.	Total Solid Matter per Gallon.	Oxygen required by Organic Matter, &c.	Nitrogen— As Nitrates, &c.	Ammonia. Saline.	Ammonia. Organic.	Hardness (Clark's Scale). Before Boiling.	Hardness (Clark's Scale). After Boiling.
Thames Water Companies.	Grs.	Grs.	Grs.	Grs.	Grs.	Degs.	Degs.
Grand Junction	20·00	0·148	0·126	0·000	0·009	14·1	3·6
West Middlesex	20·40	0·159	0·106	0·000	0·010	14·1	3·3
Southwark and Vauxhall	20·20	0·155	0·105	0·000	0·009	13·2	3·7
Chelsea	20·00	0·089	0·108	0·000	0·009	15·2	4·6
Lambeth	20·70	0·148	0·120	0·000	0·011	14·7	3·3
Other Companies.							
Kent	26·70	0·014	0·390	0·000	0·001	18·8	6·5
New River	20·70	0·094	0·132	0·000	0·004	13·7	3·3
East London	20·80	0·062	0·126	0·000	0·009	13·2	3·7

Note.—The amount of oxygen required to oxidize the organic matter, nitrites, &c., is determined by a standard solution of permanganate of potash acting for three hours.

The water was found to be clear and nearly colourless in all cases.

C. MEYMOTT TIDY, M.B.

EXTENSION OF THE CONSTANT SERVICE SYSTEM.—At the meeting of the Metropolitan Board of Works last Friday, it was reported, with reference to the notice of the West Middlesex Water-Works Company, that they propose to give, on and after the 1st of January next, a constant supply of water in a part of their district north of the Euston Road, that the Works and General Purposes Committee see no reason to dissent from the proposal.

EAST LONDON WATER-WORKS COMPANY.

The Half-Yearly Assembly of the Proprietors of this Company was held last Thursday, at the Offices, 16, St. Helen's Place, E.C., when the following report of the Directors was presented:—

The half year's accounts to Midsummer last, having been duly examined by the several Auditors, are herewith submitted to the Proprietors.

The revenue from all sources stated there amounts to £104,196 1s. 11d., being an increase of £1627 as compared with the corresponding period of 1878.

The charges for maintenance and management amount to £44,226 12s. 2d., being an increase of £4966 3s. 3d. over those of 1878; the district repairs consequent upon the frost, referred to in the last report, together with engine repairs, having been exceptionally heavy.

The expenditure on capital account has been £30,304 4s. 9d. for the new works at Lea Bridge, and additional mains and services.

The debenture stock issued in accordance with the notice in the last report has been allotted to Proprietors at premiums of £10 10s. per cent. and upwards. The amount received in premiums is £7305 13s. 6d., which must be added to capital.

The works, machinery, and property of the Company are well maintained, and in good order.

The water pumped during the half year amounted to 5,534,462,566 gallons, showing an increase of 734 millions of gallons, or nearly 8 per cent. over the quantity pumped in the corresponding period of 1878. This increase has arisen to a great extent from the breakages consequent upon the severe and repeated frosts of last season.

The Directors have always shown their desire to comply with the demands of the public, as well as the requirements of the Government, in substituting a constant for an intermittent supply. This advantage is already afforded to 92,856 out of 120,459, the total number of their tenantry, and they are taking steps by which a constant supply will be given to the whole of their extensive district.

With reference to the statement of Mr. Cross in the House of Commons on Mr. Fawcett's motion on the Water Supply of London—viz., that if the Government undertook the scheme of managing that supply, and bought up the stock of the existing Companies, the price would be as it stood on the 30th of June last—the Directors are of opinion that such an arrangement would not be consistent with the just claims for compensation on the part of the respective Companies, and they assure the Proprietors that they will use their best endeavours, in conjunction with the other Companies, to contest what appears to them a proceeding which altogether ignores the prospective advantages arising from the expenditure of capital which has not yet become remunerative.

The Directors recommend that a dividend of 3½ per cent. for the half year on the ordinary stock, and of 2½ per cent. on the debenture stock, both clear of income-tax, be declared, payable on the 10th of January next, in the usual manner.

Dr.—REVENUE ACCOUNT, FOR THE HALF YEAR ENDED JUNE 24, 1879.

Maintenance.			
To Maintenance and repair of impounding and service reservoirs, works, and pipes, or for obtaining and storing of water, including the cost of materials and labour	£2,783 17 6		
Maintenance and repair of mains, pipes, fittings, meters, and works connected with distribution of water, including the cost of materials, labour, and renewals	5,159 10 11		
Pumping and engine charges, including the cost of coals, wages, &c.	8,109 2 2		
Filtration, including the cost of materials and labour	1,738 3 0		
Salaries of Engineer and Clerks, and wages of Inspectors and Turncocks	4,712 16 2		
Rents of houses and lands, accrued due to date, and owing by the Company	768 8 6		
Abstraction of water—Thames and Lea	3,033 6 8		
Rates and taxes, exclusive of income-tax	9,351 14 1		
			£35,656 19 0
Management.			
Allowance to Directors	£1,071 17 6		
Allowance to Company's Auditors	21 8 9		
Salaries of Secretary, Accountant, and Office Clerks	1,195 12 9		
Superannuation of servants of the Company	437 9 5		
Commission to Collectors	3,021 2 0		
General establishment charges	1,819 1 11		
Law and Surveyor's charges	901 13 1		
Official Auditor and Water Examiner	191 7 9		
			8,569 13 2
Dividend and interest account for transfer of profits			55,469 9 9
Balance carried to next account, to provide for losses			4,500 0 0
			£104,196 1 11

Cr.—REVENUE ACCOUNT.

By Balance brought from former account	£4,500 0 0		
Less sums written off as losses, viz.— Empty houses, houses cut off, and bad debts	1,995 11 6		
	£2,504 8 6		
Water-rates accrued to June 24, 1879	99,804 5 5		
			£102,308 13 11
Rent of houses and lands accrued to date, and owing to the Company			1,116 8 0
Fees received for registration of shares, transfers, &c.			21 5 0
Charges for laying on water			749 15 0
			£104,196 1 11

SOUTH-WEST OF ENGLAND DISTRICT ASSOCIATION OF GAS MANAGERS.

The Third Half-Yearly Meeting of this Association was held at Salisbury, on Tuesday, the 23rd ult., in the Board Room of the Gas Company—Mr. THOMAS HARDICK presiding.

Three new members were elected—viz., Mr. W. Faulkner, of Romsey; Mr. N. H. Humphrys, of Westbury; and Mr. J. Tall, of Dartmouth.

Mr. S. W. Durkin was elected President, and Mr. George Garnett, Vice-President. Messrs. Henry Cockey, of Frome, and William Osmond, of Dorchester, were elected on the Committee; Mr. Sainsbury was elected Auditor; and Mr. T. W. R. White, of Sherborne, was re-elected Honorary Secretary.

The following papers were read:—

"Bad Gas-fittings, with practical illustrations," by Mr. S. W. Durkin, of Southampton.

"The Average Meter System as Applied to Public Lamps," by Mr. George Garnett, of Ryde.

The members dined together at the White Hart Hotel, after which they visited the Cathedral, and witnessed the blowing of the new organ by a 3½-horse power "Otto" silent gas-engine. The President had arranged with the Organist (Mr. Willis) to give some selections on the organ, which were skilfully performed, and very much enjoyed by the members.

NORTH OF ENGLAND GAS MANAGERS ASSOCIATION.—The fifth half-yearly general meeting of this Association was held in the Corporation Hall, Stockton-on-Tees, on Saturday, under the presidency of Mr. Wm. Ford. There was a large attendance of members, and the Mayor and Mr. Dodds, M.P. for the borough, were also present. The opening address was delivered by Mr. Ford, and various subjects interesting to gas managers were introduced and discussed, further details of which we must reserve for a future number. In the evening a dinner took place in the Masonic Hall—Mr. Ford in the chair. About fifty sat down, and a very pleasant and harmonious evening was passed.

PHŒNIX GASLIGHT AND COKE COMPANY.

The Ordinary Half-Yearly General Meeting of this Company was held last Wednesday, at the Bridge House Hotel, London Bridge—EDWARD HORNER, Esq., in the chair.

The SECRETARY (Mr. I. A. Crookenden) read the notice convening the meeting, and the minutes of the general meetings held on the 2nd of April and the 2nd of July, which were confirmed and signed by the Chairman. The following report of the Directors and statement of accounts were then presented:—

The Directors submit herewith accounts and balance-sheet to the 30th of June last.

In accordance with the statement in the last report, the remaining half of No. 4 retort-house is in course of completion.

The rapid increase in the consumption of coals has rendered more room for storeage absolutely necessary, and a new store is being erected capable of containing 5000 tons. For the same reason the purifying apparatus must be considerably extended, and for which contracts have been made.

These several extensions necessitate a call of 10 per cent. on the 7½ per cent. stock, payable on the 1st of December.

The balance of revenue for the half year is £51,116 5s. 9d.

Your Directors recommend that dividends be declared as follows, viz.:—

On the £20 shares, paid in full, at 10 per cent. per annum	£27,000
On the £20 new shares (£16 paid), at 10 per cent. per annum	8,000
On the capitalized stock, paid in full, at 5 per cent. per annum	3,600
On the new stock, 80 per cent. paid, at 7½ per cent. per annum	10,800
	£49,400

Less income tax, leaving a balance of £1716 5s. 9d.

No. 1.—STATEMENT OF STOCK AND SHARE CAPITAL, on *June* 30, 1879.

Acts of Parliament relating to the Raising of Capital.	Description of Capital.	Maximum Dividend Authorized.	Number of Shares Issued.	Nominal Amount of Shares.	Called up per Share.	Total paid up.	Remaining to be Called up	Total Amount Authorized.
5 Geo. IV., cap. 78	Shares	10 per cent.	27,000	£20	All.	£540,000	..	£540,000
27 & 28 Vict., cap. 159	Stock.	5 ditto.	..	..	All.	144,000	..	144,000
Ditto ditto	Ditto.	7½ ditto.	..	..	80 per cent.	288,000	£72,000	360,000
Ditto ditto	Shares.	10 ditto.	10,000	20	£16	160,000	40,000	200,000
						£1,132,000		£1,244,000

No. 2.—STATEMENT OF LOAN CAPITAL.

Act of Parliament authorizing the Loan Capital.	Description of Loan.	Rate per Cent. of Interest.	Total Amount Borrowed.
27 & 28 Vict., cap. 159	Bonds.	5 per cent.	£26,400

No. 3.—CAPITAL ACCOUNT.

Dr.

To Expenditure to Dec. 31, 1878		£1,122,537 15 10
Ditto during half year to June 30, 1879, viz.—		
New buildings and machinery in extension of works	£1,500 0 0	
New and additional meters	523 1 4	
	2,023 1 4	
Total expenditure		£1,124,560 17 2
Balance		33,839 2 10
		£1,158,400 0 0

Cr.

Description of Capital.	Certified Receipts to Dec. 31, 1878.	Paid off since that Date.	Total Receipts to June 30, 1879.
By Shares of £20 each	£540,000 0 0	..	£540,000 0 0
Capitalized stock	144,000 0 0	..	144,000 0 0
New stock	288,000 0 0	..	288,000 0 0
New shares, £20 each	160,000 0 0	..	160,000 0 0
Bonds	30,000 0 0	£3,600 0 0	26,400 0 0
	£1,162,000 0 0	£3,600 0 0	£1,158,400 0 0

No. 4.—REVENUE ACCOUNT, *for the Half Year ended June* 30, 1879.

To Manufacture of gas—		
Coals, including dues, carriage, unloading, and trimming (see Account No. 7)	£63,600 14 11	
Salaries of Engineers, Superintendents, and other officers at works	1,528 11 11	
Wages (carbonizing)	13,198 19 4	
Sundries used in carbonizing	343 15 1	
Purification, including £681 0s. 2d. for labour	2,152 6 9	
Repairs and maintenance of works and plant, materials, and labour, less £740 0s. 1d. received for old materials, &c.	26,057 16 11	
	£106,882 4 11	
Distribution of gas—		
Salaries and wages of officers (including Rental Clerks)	£2,133 4 4	
Repairs, maintenance, and renewals of mains and service-pipes, including labour	7,483 14 10	
Repairs and renewals of meters	2,639 19 1	
	12,256 18 3	
Public lamps—		
Lighting and repairing	2,833 18 0	
Rents, rates, and taxes—		
Rents payable	£592 7 0	
Rates and taxes	4,656 7 9	
	5,248 14 9	
Management—		
Directors allowance	£1,500 0 0	
Company's Auditors	100 0 0	
Salaries of Secretary, Accountant, and Clerks	1,237 15 3	
Collectors commissions	2,434 16 1	
Sundry expenses relating to collection	53 18 9	
Stationery and printing	675 5 5	
General charges	630 19 7	
	6,632 15 1	
Chemist to the Company	65 12 6	
Bad debts	620 4 10	
Superannuation allowances	571 19 7	
Insurance	81 14 3	
Total expenditure	£135,194 2 2	
Balance, carried to net revenue account (No. 5)	52,197 8 1	
	£187,391 10 3	

By Sale of gas—		
Common gas, per meter, at 3s. 4d. per 1000 cubic feet	£131,758 0 8	
Public lighting (common gas)	13,029 13 9	
		£144,787 14 5
Rental of meters		3,051 8 2
Residual products—		
Coke	£23,393 18 5	
Breeze	575 16 6	
Tar	6,849 7 2	
Ammoniacal liquor	7,448 0 7	
		38,267 2 8
Rents		1,285 5 0
		£187,391 10 3

No. 5.—PROFIT AND LOSS (NET REVENUE) ACCOUNT.

Interest on bonds to June 30, 1879	£664 19 0	Balance from last account	£57,643 7 1
Interest on loans and consumers deposits	416 3 4	Amount from revenue account, No. 4	52,197 8 1
Dividends for half year to Dec. 31, 1878	49,400 0 0		
Amount carried to reserve-fund and invested	8,243 7 1		
Balance applicable to dividends	51,116 5 9		
	£109,840 15 2		£109,840 15 2

No. 6.—RESERVE-FUND.

Balance on June 30, 1879	£123,675 19 5	Balance on Dec. 31, 1878	£113,047 8 6
		Interest on amount invested	2,385 4 4
		Balance and interest of 1877 invested	8,243 7 1
	£123,675 19 5		£123,675 19 5

No. 7.—STATEMENT OF COALS.

Description of Coal.	In Store on Dec. 31, 1878.	Received during the Half Year ending June 30, 1879.	Carbonized and Used during Half Year ending June 30, 1879.	In Store on June 30, 1879.
	Tons.	Tons.	Tons.	Tons.
Newcastle	15,456	81,129	85,862	10,723
Cannel	203	2,788	2,479	512
	15,659	83,917	88,341	11,235

No. 8.—STATEMENT OF RESIDUAL PRODUCTS.

—	In Store on Dec. 31, 1878.	Made during the Half Year ended June 30, 1879 (estimated).	Used during the Half Year (estimated).	Sold during the Half Year.	In Store on June 30, 1879.
Coke, chaldrons of 36 bush.	3,396	88,341	19,025	72,136	576
Breeze, ditto ditto	513	5,394	..	5,347	560
Tar, gallons	131,072	928,684	..	995,176	64,580
Am. liqr., butts of 108 gals.	1,359	22,640	..	23,133	866

No. 9.—STATEMENT OF GAS MADE, SOLD, &c., IN CUBIC FEET.

Description of Gas.	Quantity Made.	Quantity Sold.			Quantity used on Works, &c.	Total Quantity accounted for.	Quantity not accounted for.	Number of Public Lamps.
		Public Lights and under Contracts (estimated).	Private Lights (per Meter).	Total Quantity sold.				
Common	Thousands. 883,771	Thousands. 64,313	Thousands. 795,234	Thousands. 859,547	Thousands. 10,953	Thousands. 870,500	Thousands. 13,271	6,125

No. 10.—BALANCE-SHEET.

To Capital—				By Cash at Bankers		£26,727 1 2
For balance, per Account No. 3	£33,839 2 10			Amount invested—		
Net revenue—				Reserve-fund		123,675 19 5
For balance, per Account No. 5	51,116 5 9			Stores on hand, viz.—		
Reserve-fund—				Coals	£8,369 1 10	
For balance, per Account No. 6	123,675 19 5			Coke and breeze	372 0 0	
Unclaimed dividends	119 4 3			Tar and ammoniacal liquor	761 3 1	
Sundry tradesmen and others for amounts due for coals, stores, and sundries	26,547 14 10			Sundry stores	1,004 6 6	
						10,506 11 5
				Accounts due to the Company—		
				Gas and meter rental, for quarter ended June 30, 1879	£51,793 7 5	
				Gas and meter rental—arrears outstanding	1,422 14 0	
						53,216 1 5
				Coke and other residual products		18,196 9 1
				Sundries		2,976 4 7
		£235,298 7 1				£235,298 7 1

The Chairman said: I will now move—"That the report and accounts be received and entered on the minutes," and in doing so I think I may fairly congratulate the Proprietors on the continued success of the Company. During last half year we consumed over 4000 tons of coal more than in the corresponding period of 1878, and at a reduction of £747. That, of course, I would say is not our good management, but the fortune of the market, which has given us coal much cheaper. I should be glad to consider that coal would remain at these moderate prices, but, as you are aware, the probability is when prices are so low that they will be higher. We must all of us make our calculations on such a change of circumstances. We have to thank the engineering department of this Company for the great success with which they have managed, inasmuch as we actually sold 9730 cubic feet of gas for every ton of coal carbonized in the half year, being a considerable increase on former years, and about 1300 or 1400 feet per ton more than it was 10 years ago. There has been satisfactory progress every year, but the increase during this year has been in a greater ratio than ever, showing how much science or the good management of the Engineers has tended to give these excellent results. Then, too, the leakage has been reduced. In the second half of 1878 it was only 3 per cent., and last half year it was considerably under 2 per cent., which is really so surprising to us that it seems almost incredible; but there is the fact, that we have actually received the money for this large quantity of gas, and there can be no mistake. The principal change in our accounts is in the case of repairs and maintenance. You will see, on comparing them with last year, we have spent about £8000 more in maintenance and repairs, and I think it is good policy that we have done so. We have taken advantage of the very low price of iron to put our works, in every part of them, in such a position that should we have a reverse, and the price of coal be very high, we should require so little to be done that we should be able to devote the whole of our revenue to pay the different dividends. I think, in adopting this course, it is good policy. Although it is unseen, we are to a very large extent strengthening the Company for the future—at least, we have thought so, and especially when we are in a position to do it. The residual products have also done fairly well, but I am rather afraid, and our Officers are, that coke may not be a very good article with us during the time to come. Of course, the increased quantity of coal being used increases the quantity of coke, and certainly the demand for it does not advance with the increased quantity made, and I am afraid that we shall have to take low prices. The only article among the residuals which has done very well is ammonia, which continues to rise. Our contracts will be out at the end of the year, when I think we shall get still better prices. The results during the half year are very satisfactory in quantity. We have made, on an average, 10¼ gallons of tar, and 27 to 28 gallons of the liquor per ton of coal, which is a very good result. The general accounts, I think, call for little remark, excepting, perhaps, that some gentlemen may desire to know how it is we require to make a call. You will find, on referring to the accounts, that the working capital is very small—£33,000—on which to carry on a business like this, particularly when you think that in the winter half we have some £100,000 owing to us for gas. We have made some contracts during the present half year. We have reclaimed a certain amount of ground on the works, and several other things, which will cost—I think that we have made contracts for about £18,000. Some of those works are already done and paid for, and therefore we shall require the call we are going to make to fill up the void which will be caused by these contracts. I do not think the Shareholders will at all regret the calling up, when I say that in the ten years ending 1878 the capital of the Company increased about 24 per cent., but the increase of coals carbonized was between 59 and 60 per cent.; so that, literally speaking, if you were to take out the amount of capital per ton of coal used during that time, I think it would be found to be the lowest of almost any Company in London. That, no doubt, is why our concern is so profitable. Even last year the capital employed per ton of coal used decreased 2s. It has considerably decreased during the last few years, and it is still going on. Having made these remarks, I will move—"That the report and accounts be received and entered on the minutes."

Mr. Henry Hounsom having seconded the motion,

Mr. Cyrus Legge said he had gone through the accounts with a great deal of care, and he must confess that to him they were very satisfactory. When he saw that they had expended £26,000 for maintenance of plant, &c., and £10,000 for maintenance of mains and meters; and as, even with such large expenditure, which was considerably larger than in the corresponding period, they could still pay the dividends, and add £8000 to the reserve-fund, it did seem to him all they could wish for, and he was astonished at the result. It showed how very much care had been taken in carbonizing the coal, and also how little loss of gas there was. When, too, he looked at the revenue account, and saw that their revenue, something like £148,000 from gas, had all been collected except £620, and remembered that most of it had been collected in small amounts and in very poor districts, it seemed to him marvellous that it could have been collected so closely. The bad debts amounted to very little more than a quarter per cent. of their revenue. He did not think any one of them, in his private capacity, could have done much better. Such a state of things reflected very much credit on the Directors and Officers of the Company. They were told that Gas Companies were monopolies, that they ought to be looked after, that conditions ought to be imposed on them, and that they ought to be restricted in the way in which they managed their business, and also in their dividends. He, however, did not think that they were such monopolies as some people supposed. The public had petroleum at 6d. per gallon, which he believed even the Chairman would admit was a very great competitor with gas in the poorer districts. They had also the electric light; and he was satisfied that if by any method London could be lighted by any cheaper means than by gas, the Gas Companies might disappear—the public would not care what became of the Shareholders. He also felt satisfied that if by any economy of their own, or any good management, they could produce gas at 1s. 6d. per 1000 feet, there were a lot of dissatisfied spirits in the Metropolis who would say the price was too high, and ought to be reduced; and the Company would possibly have quite as much trouble in carrying on their affairs as they had now. From what he had seen of the accounts that day, he should like to mark, if he could, in some substantial manner, the way in which their affairs had been conducted by their Officers and by the Directors. When they saw how closely the details were watched—the smallness of the bad debts—they must admit that their affairs had been well looked after, and when they remembered the increase in the production of gas per ton of coal, and the decrease in the leakage, they must say that it reflected great credit on the Officers, and very great credit on the Directors for selecting such Officers. He did not wish to trench on the prerogatives or duties of the Directors in any way, but with such officials as they had, he thought that their position or their salaries should be somewhat considered. He might foreshadow what he would like to do after the adoption of the report, and that was to move that the Directors be requested to acknowledge the services of the Engineers, Secretary, Accountant, and Auditors of the Company, by adding such an increase to their salaries as the Directors might see fit, and that the Shareholders also allow the Directors to add £500 a year to their own remuneration. He might state that this would make no difference whatever either to the Shareholders or the public, and he thought the Directors and Officers well deserved the acknowledgment of their services which he had indicated. When he told the Shareholders that 1d. a ton saved on the amount of coals they used would pay the increase, and that the amount was only one-half more than their loss by bad debts last year, they would see how infinitesimal it was as compared with what the Directors and Officers had done for them.

The motion was then carried unanimously.

The Deputy-Chairman (Mr. J. Shand) said that after such an account of the proceedings during the past half year, of course they would expect the usual motion which he had the pleasure to make, and which he trusted he might be able to make for some time to come. In such a flourishing condition of affairs, they were enabled to pay the Shareholders the full dividends allowed by Parliament. They could not pay more than those at present, but he thought he might congratulate them on the continued security of their property. They had gone through the worst of the "scare" about the electric light, and nothing serious had happened. The light had been used in conjunction with gas for places where gas was not so well adapted, but it had not at all affected their dividends. He moved the declaration of the dividends on the various stocks of the Company mentioned in the report.

Mr. C. Harris (a Director) seconded the motion, which was carried unanimously.

The Chairman observed that he should have mentioned, when he alluded to the probable call which it was proposed to make on the 7½ per cent. stock, that it would be payable on the 1st of December, but they would be obliged to call a meeting on the 3rd of November to carry the motion. He mentioned this now for the information of the Proprietors generally; but, of course, due notice would be given to each Shareholder by post in the usual way.

Mr. Legge then proposed his resolution. After again warmly eulogizing the services of the Directors and the Officers, he said there was no Company in the Metropolis which, in his opinion, was managed so well as this. The coals cost less per ton than in any other Company—they cost so much less that it amounted to 1d. per 1000 feet on the gas made, which was a very great consideration. The total cost, too, of making the gas was in this Company less than in any other Company in the Metropolis.

The Chairman said: Before the motion is seconded, I should like to say that, with regard to the Officers, it has never been the course of the Proprietors hitherto in any way to interfere with the Directors with regard to their emolument. It has been entirely a question for the Board. The position of the Officers is periodically taken into consideration, and according to their deserts they are duly considered, and if they are worth any more they have it. That has been done during the present year. With regard to ourselves, of course human nature is very glad to get everything it can; but I think I may say, on the part of my brother Directors, that on the present occasion we would rather that the motion were withdrawn. No doubt you have seen in the public press, and there have been various rumours about, that there have been certain proposals for amalgamation with other Companies, and it might not be out of place if I were to say that something at the present time is going on. There have been many attempts of this kind which have come to nothing, and the present attempt, too, may come to nothing at all; but I think it would look bad to increase our pay at such a moment. It would seem as if we were desirous of securing larger retiring allowances. Should the present negotiations go off, then I think, afterwards, when we are in an entirely independent position, if the Shareholders like to consider our services, we shall be very glad to have them considered, but at the present time I think we must ask that the motion be at any rate postponed. I think it will be seen, with regard to the Officers, that this is a matter which is not within the province of the Shareholders. The management of the concern has always been entirely in the hands of the Board. We all thank Mr. Legge for what he has done for us to-day and on former occasions, but I think it would not be good policy to proceed with his motion on the present occasion, and I hope he will withdraw it.

Mr. Legge said he did not think that whatever was going on ought to prevent justice from being done; but as the Chairman had asked him to withdraw his motion, he would do so. It would not in the least alter his feelings, nor the feelings of the Shareholders, towards the Directors; but he thought the way in which it had been met would enhance the value of the Directors in their eyes on a future occasion, should the amalgamation not go on. But he was not aware that there was any amalgamation on, or likely to be, and he would rather that they remained as they were.

Mr. Hounsom proposed, and Mr. G. B. White seconded, a vote of thanks

to the Chairman and Directors for their able conduct of the Company's affairs.

The CHAIRMAN said: On behalf of the Directors and myself, I beg to thank you for the way in which you have received and carried this motion. You may be quite certain that we have no other interest than to do the very best we can for the Company. It is ourselves; it is as much for us as for the rest, and we shall not be likely to do anything which is not for our advantage as well as that of the Shareholders. In whatever we undertake, nothing will be done which we do not think will tend to the advantage of the Proprietors at large.

On the motion of Mr. LEGGE, seconded by Mr. C. NEW, a vote of thanks was passed to the Officers, and the proceedings terminated.

COMMERCIAL GAS COMPANY.

The Ordinary Half-Yearly General Meeting of this Company was held at the City Terminus Hotel, Cannon Street, on Friday last. The chair was occupied by RICHARD BRADSHAW, Esq., who—in consequence of vacancy caused by the death of Mr. Southwell, the late Secretary, not having yet been filled up—read the notice of the present and the minutes of the last meeting, which were confirmed.

The following is the report, which was taken as read:—

The Directors submit the accounts for the half year ended the 30th of June, 1879.

The revenue account shows a net profit for the half year of £37,528 0s. 9d. Deducting therefrom £1575 for interest on debenture stock, there remains the sum of £35,953 0s. 9d., of which, having regard to the sliding scale, and the price of gas charged during the half year, the sum of £33,050 is available for dividend.

The Directors therefore recommend the payment of dividends at the rate of 11 per cent. per annum upon the old stock of the Company, and 8 per cent. per annum upon the new stock, less income-tax, leaving £2903 0s. 9d., the balance of net profit, to be carried forward.

No. 1.—STATEMENT OF CAPITAL (STOCK) *on June 30, 1879.*

Acts of Parliament relating to the Raising of Capital.	Dividend Authorized with Gas at an Initial Price of 3s. 9d.	Paid up.	Remaining to be Paid up and Unissued.	Total Amount Authorized.
Commercial Gas Act, 15 & 16 Vict., cap. 155	10 per cent.	£450,000	..	£450,000
Ratcliff Gas Act, 18 Vict., cap. 12	Ditto.	100,000	..	100,000
Commercial Gas Act, 38 & 39 Vict., cap. 200	7 per cent.	70,000	£210,000	280,000
		£620,000	£210,000	£830,000

No. 2.—STATEMENT OF LOAN CAPITAL *on June 30, 1879.*

Acts of Parliament Authorizing the Loan Capital.	Description of Loan.	Rate per Cent. of Interest.	Total Amount Borrowed.	Remaining to be Borrowed.	Total Amt. Authorized.
Ratcliff Gas Act, 18 Vict., cap. 12	Mort. or Bd.	5 per cent.	..	£20,000	£20,000
Commercial Gas Act, 38 & 39 Vict., cap. 200	Deben. stk.	4½ per cent.	[£70,000	210,000*	280,000
* At interest not exceeding 5 per cent.			£70,000	£230,000	£300,000

Total share capital paid up (see No. 1) £620,000
Total loan capital borrowed (see No. 2) 70,000
£690,000

No. 3.—CAPITAL ACCOUNT.

Dr. Expenditure.		Cr. —	Certified Receipts to Dec. 31, 1878.	Total to June 30, 1879.
To Expenditure to Dec. 31, 1878	£658,106 15 2	By Stock	£550,000 0 0	£550,000 0 0
Ditto this half year for additional plant	9,344 1 5	New stock	70,000 0 0	70,000 0 0
	£667,450 16 7	Debenture stock	70,000 0 0	70,000 0 0
Balance	22,349 3 5		£690,000 0 0	£690,000 0 0
	£690,000 0 0			

No. 4.—REVENUE ACCOUNT, *for the Half Year ended June 30, 1879.*

To Manufacture of gas—		By Sale of gas—	
Coals, including dues, carriage, unloading, and trimming (see account No. 8)	£60,079 15 9	Common gas, per meter, at 3s. 5d. per 1000 cubic feet	£105,663 18 9
Salaries of Engineers, Superintendents, and other Officers at works	1,819 1 8	Public lighting and under contracts, common gas (See statement No. 9.)	10,308 18 0
Wages (carbonizing)	13,053 1 11		£115,972 16 9
Purification, including £1059 2s. 4d. for labour	3,327 19 10	Meter-rental	2,107 15 8
Repairs and maintenance of plant and works, materials, and labour (less £99 12s. 5d. received for old materials)	8,094 3 0	Residual products—	
	£86,374 2 2	Coke, less £1637 18s. 7d. for labour	£16,764 19 10
Distribution of gas—		Breeze, less £78 11s. 1d. for labour	452 11 4
Salaries and wages of Officers (including Rental Clerks)	£1,885 15 8	Tar	5,143 14 1
Repairs, maintenance, and renewals of mains and service-pipes, including labour	9,110 3 9	Ammoniacal liquor, less £11 12s. for labour	7,730 17 4
Repairs and renewals of meters	760 1 0		30,092 2 7
	11,756 0 5	Miscellaneous receipts, viz.—	
Public Lamps—		Rents	£107 5 5
Lighting and repairing	1,913 9 1	Interest	15 16 11
Rent, rates, and taxes	4,119 6 8		123 2 4
Management—			
Directors allowance	£1,600 0 0		
Company's Auditors	75 0 0		
Salaries of Secretary, Accountant, and Clerks	775 2 6		
Collectors commission	1,468 1 9		
Stationery and printing	529 15 10		
General charges	393 15 10		
	4,841 15 11		
Bad debts	612 6 8		
Law charges	841 13 1		
Superannuations, &c.	233 6 8		
Official Officers	75 15 11		
	£110,767 16 7		
Balance carried to profit and loss, net revenue account (No. 5)	37,528 0 9		
	£148,295 17 4		£148,295 17 4

No. 5.—PROFIT AND LOSS (NET REVENUE ACCOUNT).

Interest on debenture stock	£1,575 0 0	Balance, Dec. 31, 1878	£36,041 4 3
Balance available for dividend carried to balance-sheet	52,744 5 0	Less amount available for dividend, for half-year ending Dec. 31, 1878, appropriated as under:* £33,050 0 0	
		Insurance-fund 6,200 0 0	39,250 0 0
			£16,791 4 3
		Balance from revenue account (No. 4)	37,528 0 9
	£54,319 5 0		£54,319 5 0

* Dividend paid, £31,500; Income-tax, £656 5s.; Forfeiture, £230; Reserve-fund, £643 15s.; total, £33,050.

No. 6.—RESERVE-FUND.

Balance on June 30, 1879	£30,461 13 7	Balance on Dec. 31, 1878	£29,345 10 6
		Dividends received	£472 8 1
		Balance of amount available for dividend	643 15 0
			1,116 3 1
	£30,461 13 7		£30,461 13 7

No. 7.—INSURANCE-FUND.

Balance on June 30, 1879	£9,347 11 1	Balance on Dec. 31, 1878	£3,100 0 0
		Dividend received	47 11 1
		Amount transferred from net revenue account	6,200 0 0
	£9,347 11 1		£9,347 11 1

No. 8.—STATEMENT OF COALS.

Description of Coal.	In Store, Dec. 31, 1878.	Received during the Half Year.	Carbonized during the Half Year.	In Store, June 30, 1879.
	Tons.	Tons.	Tons.	Tons.
Common	10,031	65,719[1]6	68,650[1]6	7,100
Cannel	1,172	5,345	4,805	1,712
	11,203	71,064[1]6	73,455[1]6	8,812

No. 9.—STATEMENT OF RESIDUAL PRODUCTS.

		In Store, Dec. 31, 1878.	Made during the Half Year.	Used during the Half Year.	Sold during the Half Year.	In Store, June 30, 1879.
Coke	Chaldrons*	5,200	93,663	30,600	66,620	1,643
Breeze	do.	1,100	8,56[8]2	..	9,113[8]	613
Tar	Gallons	179,000	692,508	..	533,104	173,400
Am. liq.—	Butts of 108 galls.	4,774	20,60[9]½	..	22,035	3,318

* Under "Weights and Measures Act, 1878."

No. 10.—STATEMENT OF GAS MADE, SOLD, &c.

Description of Gas.	Quantity Made. Meter Register.	Quantity Sold.			Quantity used on Works, &c.	Total Quantity accounted for.	Quantity not accounted for.	Number of Public Lights.
		Public Lights and under Contracts (estimated).	Private Lights (per Meter).	Total Quantity Sold.				
	Thousands.	Thousands.	Thousands.	Thousands.	Thousands.	Thousands.	Thousands.	
Common	740,330	49,769	618,520	668,289	8,143	676,423	63,907	4,804

BALANCE-SHEET.

To Capital—				**By Cash at Bankers**		£22,214 1 11
For balance, per account No. 3.		£22,349 3 5		Ditto in hand for current expenditure		800 0 0
Net revenue—				Amount invested		39,809 4 8
For balance, per account No. 5.		52,744 5 0		Stores in hand—		
Reserve-fund—				Coals	£8,635 0 0	
For balance, per account No. 6.		30,461 13 7		Coke and breeze	444 14 0	
Insurance-fund—				Tar and ammoniacal liquor	2,550 12 6	
For balance, per account No. 7.		9,347 11 1		Sundries	3,124 9 5	
Unclaimed dividends		1,274 17 4				14,754 15 11
Deposits		8,080 19 9		**Accounts due to the Company—**		
Interest on debenture stock		95 0 0		Gas-rental, quarter ending June 30, 1879. . .	£43,716 15 5	
Sundry tradesmen and others for amount due for coals, stores, and sundries		9,487 15 11		Arrears outstanding	2,381 9 1	
						46,098 4 6
				For coke and other residual products. . . .	£9,558 14 10	
				For sundries	606 4 3	
						10,164 19 1
		£133,841 6 1				£133,841 6 1

The Chairman said: Gentlemen, the first resolution I have to propose for your acceptance is—"That the report and accounts be received, adopted, and entered on the minutes." These accounts have been duly audited, not only by the three gentlemen appointed by yourselves, but also by the Official Auditor appointed by the Board of Trade, and I may say that they have been thoroughly investigated. I think they speak for themselves, and they show that the result of our working for the past half year was eminently satisfactory, for you will find, on a comparison of these accounts with those for the corresponding half year of 1878, that we carbonized 6500 more tons of coal. We manufactured and sold 70 million feet more gas—an increase of three millions per week—while the rental for the gas sold to private consumers and for public lighting increased from £104,184 to £115,972, and the sale of residuals realized £30,092 against £27,450, being an increase of £2642. Now, while all this was accomplished, we faithfully performed all the obligations cast on us by our Act of 1875; in fact, we have more than kept faith with the consumers—our customers—and the public; for while our Act—which, by-the-bye, we were blamed very much by some of the Companies for accepting—compels us to give gas of an illuminating power equal to 16 sperm candles, we actually, during the past half year, supplied gas of 17½-candle power, being 1½ candles in excess of the requirements of our Act; while as regards impurities, we have been in every instance much below the maximum allowed. The gas, I need scarcely remind you, is, under the Act, tested every day by official testers. There is a testing-place for every station, and if we were found wanting in any particular, you may be sure we should very soon hear of it. I should just like to read you what Professor Williamson, the Chief Gas Examiner, has said about our gas. It is an extract from his report to the Metropolitan Board, and it deals with the quarter ending the 30th of June last. Dr. Williamson states that the illuminating power of the gas supplied by the Commercial Company at Parnell Road was—maximum, 18·4; minimum, 17·4; average, 17·8 candles. At Wellclose Square, 18·2, 16·6, and 17·3 candles. Speaking generally of all the stations supplied by the three Companies—the Chartered, South Metropolitan, and Commercial—he states that the average for the quarter was above the parliamentary standard, especially at the Beckton, Ladbroke Grove, Devon's Road, Camden Street, and Graham Road stations of The Gaslight and Coke Company, and the two stations of the Commercial Gas Company. I think that is a very satisfactory report of the results of our working for last half year. Now, gentlemen, the object of our Act of 1875 was to secure to the consumers good gas at a fair price; and, to effect this object, it was provided that the Proprietors and Consumers should equally share any loss which might occur in adverse times, while they should participate equally in any profit made in more prosperous periods. By raising the new capital authorized by that Act, by the erection of new works, and particularly by good management—for which we are very much indebted to your Engineers—we have been enabled to reduce the price of gas, first from 3s. 9d. to 3s. 5d., and secondly from 3s. 5d. to 3s. 3d. per 1000 feet, the latter price commencing from Midsummer last. This enables us to recommend for your acceptance to-day a dividend of 11 per cent. instead of 10 per cent. on the old stock—which you would have been entitled to under the old state of things—and a dividend of 8 per cent. instead of 7 per cent. on the new stock. At the same time I must tell you that your works at all the stations have been fully maintained, and that they are now in a most efficient state; and I think I am justified in congratulating you on the satisfactory report which we present to-day. There is one other matter I have to allude to—the recent unexpected death of our Secretary, Mr. Southwell. I desire to say—and to say it with the concurrence of my colleagues—that during the three years which he held office he always evinced an earnest and conscientious desire to discharge his duties to the best of his ability. I will now move the first resolution.

The Deputy-Chairman (Mr. J. D'A. Samuda, M.P.) having seconded the motion,

Mr. Muir said he desired to draw attention to the loss the Company sustained in unaccounted-for gas. The loss was larger than that sustained by other Companies. The Gaslight and Coke Company and the South Metropolitan Company lost less than 5 per cent., and he saw no reason why the Commercial Company's loss should be 8 per cent.

Mr. Gould asked if there was not an increase this half year in the bad debts. He also put a question relative to the law charges.

The Chairman thought in these times they ought not to be very much surprised if the bad debts were a little more than usual. His colleague reminded him that many of their customers had not the advantage of being gas proprietors. He might say the law charges were incurred through one of their neighbours taking proceedings for what he was pleased to term a nuisance.

The Senior Engineer (Mr. R. Jones), in reply to the question as to the leakage, said they had been compared with the larger London Companies, but that was not fair, having regard to the difference between them. The Commercial Company had miles of mains, particularly on their eastern boundary, which were supplying only the public lights.

Mr. Mum observed that the previous half year the leakage was only 7 per cent. while last time it was over 8 per cent.

Mr. Jones said that in the summer half year they took the opportunity of lifting the old and small mains, and putting down larger new ones. That involved a certain loss as regarded leakage. They did a considerable amount of this work in the last half year; but it would be seen that in the result the amount of gas sold per ton of coals had been greater last half year than ever before.

The motion was then put and carried unanimously, and the dividends recommended in the report were declared.

Mr. J. Pound said there was one duty to perform before the Shareholders separated, and that was to pass a vote of thanks to the Chairman, Deputy-Chairman, and Directors, which he moved. The sliding scale which the Directors had adopted was telling very much in favour of the Shareholders, and altogether they were indebted to the Board for the manner in which they had conducted the affairs of the Company.

Mr. F. Farnan seconded the motion, which was carried unanimously.

The Chairman, in reply, said: Gentlemen, on behalf of my colleagues and myself I beg to thank you for this renewed mark of your confidence. We quite appreciate the resolution which you are kind enough to pass every half year, and we thank you very much indeed. All we can hope is that we shall meet you next half year with as good an account as we have presented to you to-day.

A vote of thanks to the Engineers (Messrs. R. and H. E. Jones), and to the Accountant (Mr. Nash) and the other Officers of the Company, was carried unanimously.

Mr. R. Jones, in reply, thanked the Shareholders for the handsome manner in which they had passed the vote. He had told them before, and he repeated it now, that on these occasions there was nothing more flattering to the Officers of the Company than to know that they had satisfied the Proprietors, and that there was an expression of that nature given to them when they met. He need not tell them that he had been over 25 years in their service, and during that time he had tried to do his duty faithfully to the Proprietors and the Board, and he should continue to do so as long as he was able to remain in the position he held. His son, who then stood before them, and who, as they were aware, was the Engineer of the works with which they amalgamated when they went to Parliament, had a great amount of vigour, and he was sure that whenever the time came that he should be their sole Engineer, he would be able to do in the future what he hoped he had himself done in the past. They might rely on this, that every exertion was being made by their Engineers and the other Officers of the Company, and he did not know of one Officer who was not deserving of the vote of thanks awarded to them on that occasion.

The proceedings then terminated.

SOCIAL SCIENCE CONGRESS.

Meeting in Manchester.

The Twenty-third Meeting of the National Association for the Promotion of Social Science was formally opened last Wednesday evening. The Bishop of Manchester (Dr. Fraser), as President for the year, delivered the Inaugural Address, taking for his subject "Some of the Problems involved in the Social Condition of Large Cities." These, he said, he should illustrate mainly by facts and figures supplied by Manchester, not attempting any logical division or exhaustive treatment of the subject, but directing attention to certain branches of it, not devoid of interest, and certainly of supreme practical importance. After contrasting the position of Manchester now with what it was 50 years ago, and referring to the working of the Education Act, he passed on to deal with the question of the health of urban populations.

About this he said: The second topic on which I propose to touch is the class of questions which concern themselves with the health of our vast urban populations; or, as they are sometimes called by a hideous but convenient word, questions of sanitation. I do not intend to discuss questions of hereditary or congenital disease, because they apply almost equally to sparse and dense populations. It is to the social phenomena affecting the latter that I wish to confine myself this evening. Good health in towns may be said to depend upon four primary conditions: Good water supply, good drainage, good air, well-constructed and wholesome homes.

I would premise that a great number of misleading ideas lurk under what I may call the "fallacy of averages." By the exertions of the two Corporations, I believe that the death-rate in Manchester and Salford has been very sensibly reduced, and does not now exceed more than 20 or 22 per 1000 under normal circumstances; and for some time past we have been wonderfully free from epidemic or infectious disease. But as I have often heard the late Mr. Cawley, M.P. for Salford—who, from his knowledge as a civil engineer, could speak accurately on the subject—state at meetings on sanitary subjects, that while the rate of mortality in Higher Broughton, the salubrious level upon which he and I lived, did not exceed 10 or 12 per 1000, there were courts and alleys in Salford where it would rise to as high as 60 or 70. And you lose this disparity of facts when you come to strike an average, which, of course, does not represent any actual fact at all.

The chief difficulty in dealing with these great and important questions affecting the public health arises from the fact that municipal bodies and local boards rarely attack the evil till it has become intolerable; and, when they do attack it, they find it encumbered with so many vested interests or acquired rights, that it is almost impossible to deal with it

effectively, except at a cost which is enough to frighten them from dealing with it at all. It is this difficulty that has rendered practically inoperative, in many places, the Act for preventing the pollution of rivers. I know that our excellent Town Clerk (Sir Joseph Heron) stoutly maintains that the Irwell leaves Manchester in a purer condition than it enters it; by which statement I suppose he means that it deposits the pollution which it brings with it from its upper waters in its course through the town, while by the regulations of the Corporation no fresh foulness is poured into it by Manchester itself. I do not know how this may be, but I do know that to gaze upon the stream of the Irwell just where the waters of the Irk mingle with it, is not quite so pleasant a prospect as the mingling of the waters of the Ottawa and the St. Lawrence above Montreal; and local history records that two or three years ago a poor fellow who fell overboard in a regatta, though he was rescued from drowning, yet was unable to rally from the effects of the poisonous fluid that found its way into his stomach.

With regard to the general water supply, whether for drinking or for household and manufacturing purposes, of our great cities, and, indeed, of the country at large—for there are small rural villages which have quite as great a difficulty in obtaining a sufficient supply of pure water as any of the large towns—I am entirely of the opinion that was expressed in a letter written in the course of last year by His Royal Highness the Prince of Wales to the Society of Arts, which excited a good deal of attention at the time, and which seems to be shaping itself into some practical convictions in the public mind. It is neither right nor wise that the present haphazard system should be continued; that great towns, on the principle of "first come first served," should be allowed to choose their collecting-grounds for themselves; and it has become, if we are at all to consult for the interests of posterity, a peremptory necessity that England and Wales should be divided into districts by competent authority for the sufficient supply of wholesome water to the populations residing in each.

The story of Manchester and Thirlmere is well known, and need not be repeated. Perhaps the ingenious suggestion that the scheme would "improve" nature, raised an unjust prejudice against it in the minds of sentimentalists, and of my brother bishop, who was terribly afraid of the "villanous villas" that were to encircle the lake—though I am not aware that people consider even villanous villas to be an eyesore on the banks of the Lakes of Como or Maggiore. I think I can pretty confidently say, having inspected the spot carefully, and knowing that what is proposed to be done is simply to give a water surface of about 800 acres instead of the present one of barely 300—I think that I can say that Manchester's desire to secure a pure water supply for its inhabitants is not vandalism, and that nature, whether improved or not, will not be disfigured by the operation. But I thought it was quite right that the House of Commons should require Manchester to consider the claims and needs of towns and places on the route of supply; though it certainly was rather hard in the stern Chairman of Committees in the House of Lords to refuse to allow the Bill to come before that branch of the Legislature in the session of 1878, and to put the Manchester ratepayers to the delay and cost of another attempt, simply because, owing to the insertion of this new clause in the House of Commons, their lordships Standing Orders had not been, because they could not be complied with. At last, however, Manchester has obtained possession of Thirlmere, and I hope and believe that it will use its possession wisely and liberally. I hope, also, that the good people under whose land the great pipes will pass, remembering that it is a public and not a private interest that is being served, will not deal too hardly or grasp-ingly with us in the financial transactions that will necessarily accompany the operation.

The drainage of a great city has a direct connection with its water supply, especially if that supply is to any extent dependent on a river flowing through its midst, and the effect in the drainage of a great city is still one of the gravest social and sanitary problems. The sewage system of Manchester, which is rapidly advancing to completion, was recently described in an able and graphic letter in *The Times*, and the process pursued at the large municipal establishment at Holt Town is well worthy of the notice of members of the Association. The chief product of this system is a concentrated manure suited for agricultural purposes, of which it is estimated that from 20,000 to 30,000 tons can be produced in a year, and if sold at the low rate of £2 a ton would give a profit of 1s. 9d. to 2s. a ton—the gross annual expense of the nightsoil department is between £60,000 and £70,000—and this profit, if attained, while it will dispose of refuse likely to be injurious to health, will also sensibly lighten the burden to the ratepayers.

Another process, known as General Scott's first system, is in operation in Burnley, a town of 50,000 people; and yet another, known as Scott's second system, is in operation at Blackburn, a town of 80,000 people. At Blackburn they produce a manure containing 5 per cent. of ammonia, and 20 per cent. of phosphate, estimated by Dr. Voelcker, Chemist to the Royal Agricultural Society, to be of the value of £6 a ton. At Burnley the Corporation make a cement said to be equal to the best Portland. The great advantage of the Burnley system is that it requires very little land, and no large amount of costly buildings. The whole cost of the works at Burnley has been from £10,000 to £12,000; and the subsidy paid by the Corporation to Scott's Company for the licence to work the process is £1070 per annum. Sir Henry Cole says that by this process people can make 10 per cent. on their outlay in getting rid of their sewage; and that if this does not satisfy them he does not know what will. There is, of course, a limit imposed upon the profitable development of this patent system by the marketable demand for cement for building purposes, but as long as there is a demand, and competition does not bring down prices, I dare say this profit may be realized. The Town Clerk of Burnley, in answer to an inquiry I addressed to him, gives a gratifying —indeed, almost a picturesque account of the results. The works have been in operation about two years, and he says: "I think the result is highly satisfactory. Scott's Company treat about 1½ millions of water-carried sewage daily, and the effluent they turn into the river is pure enough for trout to live in. I have seen fish within a few yards of the outfall. There is no more smell at the works than is to be noticed in an ordinary farmyard. The cement made from the sludge, all of which is burnt in kilns, is of very good quality, and finds a ready sale."

It is at least a satisfactory thing to record that the Local Authorities in the great towns of Lancashire (Rochdale is, I believe, following in the steps of Manchester) are fully alive to the importance of this sewage question in its relation to health, and are adopting energetic measures of dealing with it.

The President then passed on to treat of the effect of noxious vapours and gases in the atmosphere, of overcrowding and unhealthy houses, of the work of the Manchester Health Committee, of the licensing laws, &c., &c., and concluded his address, which occupied about an hour and a half in delivery, amid loud applause.

Votes of thanks were then passed to Lord Norton, President of the Association last year, and to Dr. Fraser for his address.

The meeting then adjourned till the next day.

MANCHESTER CORPORATION GAS SUPPLY.

REPORT OF THE GAS COMMITTEE FOR THE YEAR ENDING JUNE 24, 1879.

In presenting to the Council their annual statement of accounts for the year ending the 24th of June last, the Gas Committee have much pleasure in stating that the results of the year's working exceed those of the previous year, which was the most successful on record.

The cannel market has been favourable to purchasers, but unfortunately the Committee have not been able to fully participate in its advantages, in consequence of being compelled to receive a quantity of cannel, under old contracts, at prices considerably higher than those at which the same classes of cannel could be obtained under new contracts.

In perusing the profit and loss account, to form a comparison with the previous year's working, it will be necessary to bear in mind that the gas-rental account has been diminished by the last reduction in the price of gas to the extent of £17,000 over and above what had to be provided for in the last year's accounts. Further, the Committee felt that the amalgamation of the out-townships with the city, and the subsequent transfer of the lighting arrangements to the Gas Committee, had rendered it unnecessary to continue to charge the expenses of street lighting, and they have, since the Council approved of this course in March last, expended nearly £10,000 in connection with the gas supply, and the lighting and extinguishing of the public lamps, within the city.

It is estimated that the total expenses in connection with the street-lamps will amount to £25,000 per annum, which under the new arrangement will be borne by the Gas Committee, and the rates will consequently be relieved to this extent.

The rates, taxes, and rents are some £5500 in excess of last year's expenditure under this head. It will be seen by adding these items (£32,500) to the balance of the profit and loss account (£95,813), that instead of an apparent decrease of £16,000 in comparison with the previous year, there is a difference of £16,500 in favour of the present year's working, and the gas has been supplied at a lower price and of a better quality than in any previous year.

During the exceptionally dark days of last winter, the resources at the disposal of the Gas Committee were taxed to the utmost to maintain a supply of gas, and on more than one occasion, when several foggy days were experienced in quick succession, it was only by resorting to short charges and other extraordinary measures that the Committee were able to prevent the city from being thrown into darkness. In November the daily consumption of gas was 46·62 per cent., and in December 53·85 per cent. in excess of the corresponding months of the previous year. Over 13 million cubic feet of gas were consumed in 24 hours, and 12 millions produced in the like period, being a production of nearly 2 millions more than what was stated to be the maximum daily make. The total quantity of gas transmitted from the works during the year has amounted to 2,314,970,000 cubic feet—an increase of 172 million cubic feet, or 8·02 per cent., over the previous year. The consumers number 73,886, representing an increase of 1·16 per cent.

The difficulties in providing a supply of gas during the foggy weather were increased by the very limited storeage available at the Gaythorn and Rochdale Road works; and, having regard to this fact, the Committee have done all in their power to hasten the completion of one of the new holders now in course of construction at Bradford Road, in order that it may be in use next winter, and they hope that the special arrangements which they have made with the Contractors will have the desired effect.

It will be observed that the expenditure on capital account has amounted to £196,631 5s. 8d., against £111,124 11s. in 1878, and £60,302 5s. 7d. in 1877. The heavy expenditure in connection with the new works has caused great anxiety, which has been increased by the continued depression in trade.

The Committee therefore feel that to establish a new manufactory, with its attendant expenses of separate management, &c., until the resources of the existing works are fully developed, would be to undertake a serious responsibility, and they decided, some time ago, not to enter into any further contracts at the new works, but to devote their whole energies to the completion of the holders and the improvement of the existing works. With the latter object in view, large gas-works in London and elsewhere have been inspected, and much valuable information obtained, and already the result is apparent in the important improvements which are being rapidly introduced.

The electric light, and other modes of street lighting, have also received careful attention, and, altogether, the year has been a most arduous one to the Committee.

In concluding the notes upon the accompanying accounts, it may be well to draw attention to the fact that it has been decided to place the sum of £52,000 at the disposal of the Improvement Committee; but it is a question for careful consideration whether the Council would sanction the payment by the Committee of so large a sum for improvement purposes another year, since the £52,000 includes interest on unproductive capital to the extent of £12,000, which, in the opinion of the Committee, should be deducted; and, further, the payment of such a sum would prevent the desired reduction in the price of gas.

The reports of the Analytical Chemist and the Auditors are submitted, and the usual statistical statements are appended, viz.:—Appendix A, statement of lamp and private rentals; Appendix B, statement of gas transmitted from the works; Appendix C, table showing the number of meters in use; Appendix D, table showing gas-mains laid and taken up; Appendix E, statement showing the amount of gross profit and the mode of its appropriation, &c., since 1862.

(Signed) JOSEPH LAMB, Chairman.

Gas Offices, Town Hall, Sept. 25, 1879.

"*Officer of Health's Department, Town Hall,*
"*Manchester, Sept. 23, 1879.*

"To the Chairman of the Gas Committee.

"Sir,—I have the honour to report to you that the average illuminating power of the Manchester gas during the past year has been equal to that of 20·81 London standard candles.

"The gas has been tested photometrically at the Gaythorn and at the Rochdale Road stations almost daily. The standard of comparison adopted has been the light of a London standard sperm candle burning at the rate of 120 grains per hour. The average of the highest readings of the photometer has been equal to 22·17 candles, and of the lowest 19·51 candles.

"The gas has been tested daily for sulphuretted hydrogen and for ammonia. It has also been allowed to flow continuously through test solutions, and the amount of impurity in large volumes of the gas has been determined. As the gas has passed through these solutions during the night as well as the day, and during Sundays as well as on ordinary days, any negligence in the purification at these times would have been detected.

"To the daily tests the gas has very rarely yielded any traces of sulphuretted hydrogen. From the large volume of gas flowing through the test solution (not less than 500 cubic feet per month), rarely has any of this impurity been separated, and in no case more than a small fraction of a grain.

"The quantity of ammonia in the gas has been almost uniformly below 1 grain in 100 cubic feet; generally, indeed, the quantity has been inappreciable.

"The carbonic acid in the gas has varied from 1½ to 2¾ per cent. of the volume of the gas. From the great difference in the amount of pyrites in the different coals and cannels employed, the amount of sulphur existing in the gas in combination with carbon has varied considerably.

"A large number of trials have also been continuously made on the condensation of illuminating constituents by bromine, semi-hydrated sulphuric acid, &c. The number of volumes of oxygen required for the combustion of the gas has also been determined, and the specific gravity of the gas ascertained. Some trials on a large scale have also been made on the conversion of some of the illuminating constituents into nitrobenzole and oxalic acid.

(Signed) "JOHN LEIGH, M.R.C.S.L., Medical Officer of Health."

"13, *Norfolk Street, Manchester, Sept.* 24, 1879.

"The Chairman of the Corporation Gas Committee.

"Dear Sir,—We have carefully audited the accounts of your department for the year ending June 24, 1879, and find the same correct.

"Vouchers have been produced to us for all payments, and we have verified the bank balances with the Bankers pass-books.

"The balance-sheet and profit and loss account faithfully exhibit the position and working of the department to that date.

(Signed) "LEES AND GRAHAM, Public Accountants."

STATEMENT OF ASSETS AND LIABILITIES.

PERMANENT ASSETS.

Gaythorn station—			
Land, buildings, and apparatus, as per last report—			
Land	£60,467 16 10		
Buildings	61,299 5 8		
Apparatus	47,237 18 11		
	£169,005 1 5		
Less depreciation	4,813 17 4		
	£164,191 4 1		
One year's outlay to June 24, 1879—			
Engine and boiler house	£1,759 7 10		
Stables	213 13 10		
Horses	68 0 0		
Purifiers	538 5 11		
Boilers	600 0 0		
Condenser	173 19 8		
Hydraulic stoker	8,660 14 9		
Railway extension	212 7 3		
Weigh-bridge	22 4 0		
Experimental apparatus	25 10 0		
No. 2 retort-house	4 11 11		
Railway sidings	982 5 8		
	13,260 0 10		
		£177,451 4 11	
Rochdale Road station—			
Land, buildings, and apparatus, as per last report—			
Land	£31,805 4 10		
Buildings	110,953 11 2		
Apparatus	83,811 14 4		
	£226,570 10 4		
Less—			
Materials sold	£11 14 0		
Depreciation £8628 14s. 7d., less £500 over deducted last year	8,128 14 7		
	8,140 8 7		
	£218,430 1 9		
One year's outlay to June 24, 1879—			
Improvements No. 1 retort-house	£2,850 0 0		
Ditto No. 4 ditto	1 4 2		
Mechanics shops	591 12 4		
Stables	75 11 2		
Offices	2 7 6		
Experimental apparatus	60 19 8		
Office furniture	5 3 9		
Hydraulic stoker	708 3 9		
	4,295 2 4		
		222,725 4 1	
Droylsden station—			
Land, buildings, and apparatus, as per last report—			
Land	£328 17 3		
Buildings	5,538 10 2		
Apparatus	5,465 8 7		
	£11,832 16 0		
Less depreciation	494 16 2		
	£11,337 19 10		
One year's outlay ending June 24, 1879—			
Apparatus in connection with gas purification improvement	117 3 10		
		11,455 3 8	
Bradford Road station—			
Land, as per last report	£75,397 15 1		
Buildings, ditto	26,067 4 10		
Apparatus, ditto	16,860 2 4		
	£118,325 2 3		
One year's outlay ending June 24, 1879—			
Land	£36,980 19 8		
Levelling and conveyance	2,004 10 9		
Gas-tanks	62,069 18 1		
Sewering	551 5 8		
River wall	1,381 5 3		
Engine and purifying house	6,966 12 6		
Canal dock and basin	950 10 11		
Retort-houses	22,115 18 7		
Architect's commission	2,652 18 0		
Railway sidings	13,838 3 0		
Tar wells	6,239 19 3		
Travelling crane	604 11 6		
General construction apparatus	257 12 3		
Lithography and stationery	16 0 1		
Temporary offices, paving, &c.	481 2 6		
Testing-machine	32 11 0		
Miscellaneous expenses	63 0 6		
	157,206 19 6		
		275,532 1 9	
Carried forward			£687,163 14 5

Brought forward			£687,163 14 5
Street-mains stores (Poland Street)—			
Land, as per last report	£1,406 0 0		
Buildings, ditto	1,521 7 2		
Apparatus, ditto	342 7 2		
	£3,269 14 4		
Less depreciation	77 19 5		
	£3,191 14 11		
One year's outlay to June 24, 1879—			
Stables	103 9 8		
		3,295 4 7	
Street-mains—			
Main-pipes, as per last report	£251,542 18 0		
Less depreciation	6,288 11 5		
	£245,254 6 7		
One year's outlay to June 24, 1879	8,750 3 6		
		254,004 10 1	
Service-pipes—			
Service-pipes, laid as per last report	£27,275 0 10		
Moiety of one year's outlay, charged to capital account	1,666 15 8		
		28,941 16 6	
Hired meters—			
Outlay, as per last report	£56,550 8 10		
Less depreciation	5,655 0 10		
	£50,895 8 0		
One year's outlay to June 24, 1879	10,868 6 7		
		61,763 14 7	
Meter-proving apparatus—			
Outlay, as per last report	£75 0 11		
Less depreciation	7 10 0		
		67 10 11	
New lamps		363 3 9	

FLOATING ASSETS.

Cannel, retorts, and other materials on hand	£56,828 6 7	
Gas-rents and sundry accounts due to the Committee—		
Revenue account	66,591 3 4	
Extension ditto	204 12 2	
Balance in the bank, June 24, 1879	100,798 9 2	
Ditto in the Treasurer's hands, ditto	166 13 5	
		224,589 4 8
		£1,260,188 19 6
Excess of assets, June 24, 1879	£539,735 6 10	
Ditto of assets, June 24, 1878	511,008 11 3	
Increase, being the amount charged upon profit and loss for the present year towards liquidation of the mortgage debt, and carried to capital account	£28,726 15 7	

LIABILITIES.

Mortgage—Total amount secured by mortgage	£545,761 11 8	
Sums advanced not secured by mortgage	4,818 17 10	
		£550,580 9 6
Purchase of land, the purchase-money being left in the hands of the Committee at interest		1,750 0 0
Sundry accounts owing—		
Revenue account		26,534 11 3
Extension ditto		49,357 9 4
Deposits in hand		19,843 11 1
Amount placed in reserve-fund		20,387 11 6
Surplus for the year ending June 24, 1879		52,000 0 0
Balance, being excess of assets		539,735 6 10
		£1,260,188 19 6

PROFIT AND LOSS ACCOUNT.

EXPENDITURE.

To Cannel			£170,501 8 7
Retort men's wages			28,460 17 7
Retorts, materials, and setting			6,023 1 5
Labourers wages and repairs of works—			
Gaythorn station	£7,328 6 5		
Rochdale Road station	10,387 2 8		
Droylsden	132 12 10		
Street-mains	6,958 6 10		
Repairs of hired meters	691 1 1		
		25,397 9 10	
Purifying charges		4,868 2 4	
Salaries		11,412 17 3	
Collectors poundage, &c.		6,880 1 4	
Chief and other rents, rates, and taxes		9,930 15 3	
Income-tax		2,386 7 2	
Amount transferred to capital account for depreciation of works—			
Gaythorn station—			
4 p. ct. on buildings (£61,299 5s. 8d.)	£2,451 19 5		
5 p. ct. on apparatus (£47,237 18s. 11d.)	2,361 17 11		
	£4,813 17 4		
Rochdale Road station—			
4 p. ct. on buildings (£110,953 11s. 2d.), £4,438 2s. 10d., less £500 over deducted last report	£3,938 2 10		
5 p. ct. on apparatus (£83,811 14s. 4d.)	4,190 11 9		
	8,128 14 7		
Droylsden works—			
4 p. ct. on buildings (£5538 10s. 2d.)	£221 10 9		
5 p. ct. on apparatus (£5465 8s. 7d.)	273 5 5		
	494 16 2		
Street-mains store (Poland Street)—			
4 p. ct. on buildings (£1521 7s. 2d.)	£60 17 1		
5 p. ct. on apparatus (£342 7s. 2d.)	17 2 4		
	77 19 5		
Street-mains—			
2¾ p. ct. on main-pipes (£251,542 18s.)		6,288 11 5	
Hired meters and fittings—			
10 p. ct. on £56,550 8s. 10d.		5,655 0 10	
Meter-proving apparatus—			
10 p. ct. on £75 0s. 11d.		7 10 0	
		25,466 9 9	
Stationery and advertising		1,233 12 4	
Law expenses, stationery, receipt, postage, and deed stamps		332 14 8	
Miscellaneous expenses		1,148 8 10	
Clothing for inspectors		366 14 10	
Subscriptions to the Eye Hospital		5 5 0	
Bad debts		1,200 10 1	
Expenditure on lamp lighting (portion of year)	£9,484 5 8		
Less gas used on account of ditto	7,382 9 8		
		2,101 16 0	
Rent of offices		1,800 0 0	
Balance		95,813 14 5	
		£395,350 6 8	
Interest on loans		£17,182 0 1	
Ditto on deposits repaid		125 1 2	
Amount transferred to capital account towards liquidation of mortgage		28,726 15 7	
Interest on deposits in hand		777 18 2	
Surplus payable to the Improvement Committee		52,000 0 0	
		£98,811 15 0	

PROFIT AND LOSS ACCOUNT—(*continued*).

INCOME.

By Gas-rental—			
Within the city—			
Private consumers	£219,089 1 5		
Meter-rents	4,340 7 8		
Public lamps £15,116 5 9			
Less portion of year not charged 7,382 9 8			
	£7,733 16 1		
Beyond the city—		£231,163 5 2	
Private consumers	£79,267 16 6		
Meter-rents	2,029 17 7		
Public lamps	6,877 19 5		
	88,175 13 6		
		£319,338 18 8	
Coke		22,316 5 4	
Tar		34,683 2 6	
Ammonia water		18,899 4 2	
Rents		112 16 0	
		£395,350 6 8	
Balance brought forward, being the gross profit on the year's working		£95,813 14 5	
Transfer from reserve-fund		2,998 0 7	
		£98,811 15 0	

GENERAL SUMMARY OF RECEIPTS AND EXPENDITURE ON CAPITAL AND REVENUE ACCOUNT.

RECEIPTS.

To Balance in bank, June 24, 1878	£47,752 18 2	
Ditto in Treasurer's hands, June 24, 1878	185 8 8	
Ditto of sums owing to and by the Committee, including stocks on hand, June 24, 1878	132,784 3 5	
Carried forward		£180,722 10 3
Brought forward		£180,722 10 3
Balance of profit and loss account, as per statement		52,000 0 0
Loans received		100,010 11 6
Materials sold (capital account), as per statement—		
Rochdale Road station		11 14 0
Amount transferred from revenue account—		
For depreciation of works		25,466 9 9
Liquidation of mortgage		28,726 15 7
		£386,938 1 1

EXPENDITURE.

By Loans repaid		£6,458 16 7
Improvement Committee—		
Surplus for the year ending June 24, 1878		51,996 5 3
Expenditure on capital account—		
Gaythorn station	£13,260 0 10	
Rochdale Road station	4,295 2 4	
Bradford Road station	157,206 19 6	
Street-mains store	103 9 8	
Street-mains	8,750 3 6	
Service-pipes (one moiety)	1,666 15 8	
Hired meters	10,868 6 7	
Droylsden station	117 3 10	
Lamps	363 3 9	
	196,631 5 8	
Balance in bank, June 24, 1879	£100,798 9 2	
Ditto in the Treasurer's hands, June 24, 1879	166 13 5	
	100,965 2 7	
Amount transferred from reserve-fund		2,998 0 7
Balance of sums owing to and by the Committee, including stocks on hand, June 24, 1879		27,888 10 5
		£386,938 1 1

GEORGE B. JACKSON, Indoor Superintendent.

[APPENDIX A.]

Statement of the Lamp and Private Rental (including Meter-Rents) derived from Townships within and beyond the City respectively, for the Years 1877-78 *and* 1878-79.

	Half Year ending Dec. 25, 1877.	Half Year ending June 24, 1878.	Total for the Year 1877-78	Half Year ending Dec. 25, 1878.	Half Year ending June 24, 1879.	Total for the Year 1878-9.
Within the city—	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Township of Manchester—						
Private rental	68864 11 9	65887 15 6		63227 17 4	71341 13 1	
Public lamps	4249 17 6	3859 1 6		4297 6 6	3898 5 8	
	73114 9 3	69746 17 0		67525 3 10	75239 18 9	
Other townships—						
Private rental	44777 6 2	43334 7 9		41718 12 4	47049 14 2	
Public lamps	3429 18 10	3454 2 0		3486 2 3	3526 3 6	
	48207 5 0	46788 9 9		45204 14 7	50575 17 8	
Total within the city	121321 14 3	116535 6 9	237857 1 0	112729 18 5	125815 16 5	238545 14 10
Beyond the city—						
Private rental	39620 15 7	38459 19 2		37812 1 6	43485 12 7	
Public lamps	3329 6 7	3264 13 10		3384 8 11	3493 10 6	46979 3 1	88175 13 6
Total beyond the city	42950 2 2	41724 13 0	84674 15 2	41196 10 5	172794 19 6	326721 8 4
Deduct lamps, portion of year not charged					7382 9 8	7382 9 8
Gross rental	164271 16 5	158259 19 9	322531 16 2	153926 8 10	165412 9 10	319338 18 .8

Within the city: Gross rental (1877-78) £237,857 1s.; ditto (1878-79) £231,163 5s. 2d.; decrease, £6693 15s. 10d. Beyond the city: Gross rental (1877-78) £84,674 15s. 2d.; ditto (1878-79) £88,175 13s. 6d.; increase, £3500 18s. 4d. Total: Gross rental (1877-78) £322,531 16s. 2d.; ditto (1878-79) £319,338 18s. 8d.; decrease, £3192 17s. 6d.

[APPENDIX B.]

Comparative Statement of the Gas transmitted from the Works, in the Daytime and during the Twenty-four Hours, for the Years 1877-78 *and* 1878-79.

	Daytime.				Twenty-four Hours.			
	1877-78.	1878-79.	Increase.	Decrease.	1877-78.	1878-79.	Increase.	Decrease.
	Cubic Feet.	Cubic Feet.	Per cent.	Per cent.	Cubic Feet.	Cubic Feet.	Per cent.	Per cent.
July	24,307,000	27,103,000	11·50	....	89,191,000	102,600,000	15·03	....
August	23,603,000	26,718,000	13·20	....	107,529,000	115,779,000	7·67	....
September	27,444,000	27,444,000	....	....	139,988,000	142,422,000	1·74	....
October	34,811,000	37,090,000	6·55	....	204,019,000	209,901,000	2·88	....
November	40,216,000	58,964,000	46·62	....	249,454,000	274,759,000	10·14	....
December	53,339,000	82,065,000	53·85	....	289,595,000	325,625,000	12·41	....
January	58,490,000	72,076,000	23·23	....	292,418,000	319,726,000	9·34	....
February	49,242,000	60,579,000	23·02	....	233,067,000	262,150,000	12·48	....
March	38,854,000	48,603,000	25·09	....	193,368,000	215,687,000	11·54	....
April	32,621,000	38,095,000	16·78	....	143,338,000	150,650,000	5·10	....
May	28,235,000	32,828,000	16·27	....	113,214,000	122,471,000	8·18	....
June	23,203,000	20,540,000	....	11·48	87,816,000	73,300,000	....	16·53
Total	434,365,000	532,105,000	22·50	....	2,142,997,000	2,314,970,000	8·02	....

During the daytime (1877-78), 434,363,000 cubic feet; (1878-79) 532,105,000 cubic feet; increase, 97,742,000 cubic feet. During the twenty-four hours (1877-78), 2,142,997,000 cubic feet; (1878-79) 2,314,970,000 cubic feet; increase, 171,973,000 cubic feet.

[APPENDIX C.]

Table showing the Number of each Size of Meters in Use on June 24, 1878 *and* 1879, *respectively.*

Size of Meters.	Townships within the City.														Townships beyond the City.		Total.		Increase.	Decrease.
	Manchester.		Chorlton-on-Medlock.		Hulme.		Ardwick.		Beswick.		Cheetham.		Total within the City.							
	1878.	1879.	1878.	1879.	1878.	1879.	1878.	1879.	1878.	1879.	1878.	1879.	1878.	1879.	1878.	1879.	1878.	1879.		
1 light	14	14	4	1	6	7	3	1	..	..	..	..	27	23	10	10	37	33	..	4
2 lights	10516	9995	3528	3352	6348	6057	2524	2441	548	585	1327	1230	24791	23660	9904	9810	34695	33470	..	1225
3 ,,	4270	4266	2900	2939	2557	2623	800	847	144	167	1468	1501	12139	12343	6315	6822	18454	19165	711	..
5 ,,	2679	2712	1900	1982	871	894	406	424	54	60	1118	1177	7028	7249	4190	4542	11218	11791	573	..
10 ,,	1749	1778	605	655	278	290	151	158	19	22	311	335	3113	3238	1454	1544	4567	4782	215	..
15 ,,	2	2	..	..	..	..	..	..	..	..	..	2	2	4	..	..	2	4	2	..
20 ,,	1050	1062	178	184	107	117	71	64	4	4	64	68	1474	1409	443	458	1917	1957	40	..
30 ,,	472	485	44	47	39	40	16	19	5	6	31	37	607	634	154	174	761	808	47	..
45 ,,	33	32	1	1	2	2	2	2	..	..	..	..	38	37	8	8	46	45	..	1
50 ,,	336	361	21	25	27	28	17	21	2	2	23	24	426	461	108	113	534	574	40	..
60 ,,	136	140	14	13	15	16	2	2	..	..	9	9	176	180	28	25	204	205	1	..
80 ,,	119	118	11	9	11	11	5	6	..	..	1	2	147	146	20	25	167	171	4	..
100 ,,	169	194	10	13	6	6	9	8	1	2	7	8	202	231	43	44	245	275	30	..
130 ,,	54	58	7	7	6	6	4	6	..	..	2	2	73	79	18	20	91	99	8	..
200 ,,	23	25	4	4	3	3	1	..	..	2	3	3	34	37	14	14	48	51	3	..
250 ,,	5	3	..	..	..	..	..	..	1	1	..	..	6	4	1	1	7	5	..	2
300 ,,	13	13	5	1	3	3	..	..	..	..	3	3	24	20	19	21	43	41	..	2
350 ,,	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	1	1	..	..
600 ,,	3	3	..	..	..	..	..	..	..	..	..	..	3	3	..	..	3	3	..	..
1000 ,,	1	1	..	..	..	..	..	..	..	..	..	..	1	1	1	1	2	2	..	..
Total	21644	21262	9232	9233	10279	10103	4011	3999	778	851	4367	4401	50311	49849	22731	23633	73042	73482	1674	1234

Total increase, 1674. Deduct decrease, 1234; net increase, 440 meters.

[APPENDIX C—*continued.*]

Statement showing the Number and Size of Meters on Hire on June 24, 1879 (included in preceding Table).

	1 Light.	2 Lights.	3 Lights.	5 Lights.	10 Lights.	20 Lights.	30 Lights.	50 Lights.	60 Lights.	80 Lights.	100 Lights.	150 Lights.	Total, 1879.	Total, 1878.	Increase, 1879.
Within the city	22	15700	8577	4158	1214	315	104	63	26	16	23	2	30220	28733	1487
Beyond the city	9	4792	5189	3031	609	61	19	12	5	..	9	..	13736	12152	1584
Total	31	20492	13766	7189	1823	376	123	75	31	16	32	2	43956	40885	3071

[APPENDIX D.]

Gas-Mains Laid and Taken Up during the Year ending June 24, 1879.

LAID.	Diam. 2 in.	Diam. 3 in.	Diam. 4 in.	Diam. 5 in.	Diam. 6 in.	Diam. 8 in.	Diam. 9 in.	Diam. 12 in.	Diam. 15 in.	Diam. 18 in.	Diam. 24. in.	Diam. 30 in.	Total Length.	Remarks.
Townships within the city—	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	
Manchester	96	930	147	11	201	50	..	153	38	..	411	40	2077	
Hulme	181	654	22	..	23	..	..	..	..	..	..	..	880	
Chorlton-on-Medlock	77	635	..	..	..	..	..	554	..	..	..	..	1266	
Cheetham	333	929	81	..	10	..	..	..	..	..	..	..	1373	
Ardwick	55	26	..	..	..	..	..	..	..	..	..	..	81	
Beswick	90	108	..	..	..	..	..	811	139	..	..	..	1148	
Townships within the city	852	3282	250	11	234	50	..	1518	177	..	411	40	6825	Yards laid— Within the city.
Townships beyond the city	3111	7421	2670	..	369	303	..	1033	..	536	643	672	16758	Beyond the city.
Total	3963	10703	2920	11	603	353	..	2551	177	536	1054	712	23583	During the year.
													Being 13¼ miles and 263 yards.	
TAKEN UP.														Yards taken up—
Townships within the city	540	527	..	82	333	61	31	51	385	47	..	..	2057	Within the city.
Townships beyond the city	568	79	1178	..	320	120	..	935	..	..	..	..	3200	Beyond the city.
Total	1108	606	1178	82	653	181	31	986	385	47	..	..	5257	During the year.
													Being 2¾ miles and 417 yards.	
Laid during the year 1878–79	3963	10703	2920	11	603	353	..	2551	177	536	1054	712	23583	
Taken up during the year 1877–78	1108	606	1178	82	653	181	31	986	385	47	..	..	5257	

Net increase during the year ending June 24, 1879 . . . . . 18,326 yards; being 10½ miles and 286 yards.

Summary.

	Diam. 2 in.	Diam. 3 in.	Diam. 4 in.	Diam. 5 in.	Diam. 6 in.	Diam. 7 in.	Diam. 8 in.	Diam. 9 in.	Diam. 10 in.	Diam. 11 in.	Diam. 12 in.	Diam. 13 in.	Diam. 14 in.	Diam. 15 in.	Diam. 16 in.	Diam. 17 in.	Diam. 18 in.	Diam. 20 in.	Diam. 22 in.	Diam. 24 in.	Diam. 30 in.	Total Length
Pipes laid to June 24, 1878—	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.
Within the city	263090	128070	52663	14758	31776	738	15493	13486	1456	279	29619	309	7222	4978	3993	55	5802	324	477	6799	3703	584490
Beyond the city	158711	75835	57468	6594	33350	410	28817	13713	1327	1808	21372	..	749	341	..	..	4628	..	..	462	2423	406008
Pipes laid during the year ending June 24, 1879—	421801	203905	109531	21352	65126	1148	44310	27199	2783	2087	50991	309	7971	5319	3993	55	10430	324	477	7261	6126	992498
Within the city	852	3282	250	11	234	..	50	..	..	..	1518	..	..	177	..	..	..	..	..	411	40	6825
Beyond the city	3111	7421	2670	..	369	..	303	..	..	..	1033	..	..	..	..	..	536	..	..	643	672	16758
Deduct pipes taken up during the year ending June 24, 1879	425764	214608	112451	21363	65729	1148	44663	27199	2783	2087	53542	309	7971	5496	3993	55	10966	324	477	8315	6838	1016081
	1108	606	1178	82	653	..	181	31	..	..	986	..	..	385	..	..	47	..	..	..	..	5257
Total	424656	214002	111273	21281	65076	1148	44482	27168	2783	2087	52556	309	7971	5111	3993	55	10919	324	477	8315	6838	1010824

Total, 1,010,824 yards, or 574¼ miles and 144 yards.

[APPENDIX E.]

Statement showing the Amount of Gross Profit, and the Mode of its Appropriation; also the Amount of Borrowed Money Owing, and the Excess of Assets, &c., from the Year 1862 to the present Date.

Year ending June 24.	Profits.	Maximum Price of Gas, per 1000 Feet, within the City.	Appropriation of Gross Profits. Interest.	Liquidation of Mortgage Debt.	Surplus.	Amount advanced to Improvement Committee in anticipation of Profits.	Paid over for Improvement Purposes.	Retained towards Repayment of Advances made to the Improvement Committee in anticipation of Profits.	Carried to Reserve-Fund to meet future Contingencies.	Balance owing of Amounts advanced in anticipation of Profits.	Borrowed Money Owing.	Amount charged to Revenue in respect of Depreciation of Works and Mains.	Excess of Assets.
	£ s. d.	s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
1862	42667 7 1	4 0	15482 3 2	19330 14 4	7854 9 7	....	7854 9 7	....	....	....	382539 7 10	12179 4 11	126591 4 6
1863	55804 12 9	Half year 4 0 ,, 3 9	14932 17 8	18609 17 4	22261 17 9	....	22261 17 9	....	....	....	362877 8 10	12666 18 11	145201 1 10
1864	59545 18 9	Half year 3 9 ,, 3 6	13888 12 10	17810 1 0	27847 4 11	....	27847 4 11	....	....	....	335808 16 9	12690 12 9	163011 2 10
1865	56432 4 5	Half year 3 6 ,, 3 2	13086 10 9	17587 0 11	25758 12 9	....	25758 12 9	....	....	....	306951 2 2	13050 6 6	180598 3 9
1866	52553 2 10	3 2	13252 13 0	19781 2 0	19516 7 10	....	19516 7 10	....	....	....	347472 2 11	13817 2 9	200382 5 9
1867	47323 0 4	3 2	14167 11 7	19898 0 4	13257 8 5	....	13257 8 5	....	....	....	331725 9 7	14628 8 6	220280 6 1
1868	49546 4 7	3 2	14314 17 9	20246 0 5	14985 6 5	13050 8 5	28044 14 10	....	....	....	351035 10 4	15173 2 5	239685 15 6
1869	52736 18 4	3 2	15467 12 6	22688 14 4	14580 11 6	11303 19 8	25884 11 2	....	....	24363 8 1	395469 8 5	15387 15 7	262374 9 10
1870	65343 10 8	3 2	16784 13 8	24487 6 0	24071 11 0	3750 0 0	27821 11 0	....	....	28113 8 1	432941 1 9	17633 5 10	286861 15 10
1871	79322 9 5	3 2	18329 0 5	27050 15 11	33942 13 1	....	28020 11 11	5922 1 2	....	22191 6 11	448593 9 5	19002 10 5	313912 11 9
1872	63257 9 7	3 2	18539 19 6	27805 15 11	16911 14 2	13293 10 3	30205 4 5	....	....	35484 17 2	459593 9 5	22283 6 8	341718 7 8
1873	63603 0 6	One qr. 3 2 Three ,, 3 4	18413 7 1	28588 19 6	16600 13 11	16641 11 6	33242 5 5	....	....	52126 8 8	460640 11 0	22614 18 6	370307 7 2
1874	77465 12 2	Half year 3 4 ,, 3 8	18861 13 3	28977 9 6	29626 9 5	183 9 4	29809 18 9	....	....	52309 18 0	457834 5 0	22849 4 5	399284 16 8
1875	106807 6 5	3 8	17182 18 8	28514 17 11	61109 9 10	....	35257 2 1	25852 7 9	....	26457 10 3	432310 2 0	22908 7 0	427799 14 7
1876	101232 4 6	Half year 3 8 ,, 3 6	16185 10 8	28070 2 5	36976 11 5	....	39410 17 0	17565 14 5	....	8891 15 10	405362 14 1	23491 15 7	455869 17 0
1877	100539 16 7	Half year 3 6 ,, 3 4	15518 2 1	27729 15 8	57291 18 10	....	42133 16 3	8891 15 10	6266 6 9	....	377359 2 6	24021 13 9	483599 12 8
1878	111594 3 4	Half year 3 4 ,, 3 0	15069 14 2	27408 18 7	69115 10 7	....	51996 5 3	....	17119 5 4	....	457028 14 7	25194 19 6	511008 7 3
1879	95813 14 5	3 0	17307 1 3	28726 15 7	52000 0 0	....	52000 0 0	....	....	....	550580 9 6	25466 9 9	539735 6 10
Tot.	1261588 16 8	....	286785 0 0	433315 7 8	563708 11 5	....	540322 19 4	....	23385 12 1	....	....	335660 3 9	....

The Monthly Meeting of the Manchester City Council was held last Wednesday—the MAYOR (Alderman Grundy) presiding—when the preceding report of the Gas Committee, and the accounts for the year ending June 24, were received, and ordered to be entered upon the minutes.

Alderman LAMB (Chairman of the Gas Committee), in moving the adoption of the report, said the accounts showed a less gross profit than last year's of something like £15,750. This would, no doubt, create surprise amongst some members of the Council, who might think there had been mismanagement. That it was not so in reality he believed he should be able to show. The make of gas during the past year had been the greatest on record, and this, he thought, would prove to the Council how wisely they acted some years ago when they decided to enlarge the works. The increase in the consumption of gas had been almost marvellous, and if they had not provided for a larger supply their position at the present time would have been unenviable. The greatest quantity consumed in one day during the past year was about 13 million feet, and in one week

over 75 million feet. No doubt much of the extra consumption which had taken place was due to the long and severe winter and to the extra dark and foggy days which had been experienced. As they could never tell when those days would recur, he thought the Council would say that the Committee acted prudently in making provision for any emergency that might arise. The Council would see that the Gas Committee had credited the Improvement Committee with £52,000; but in order to do that they had had to take £2998 from the reserve-fund. It would become a question for the Council to consider what should be the maximum annual amount to be paid over to the Improvement Committee from the gas profits. Improvements of the works, and a reduction in the price of gas, must come in for a share of these profits. The principle was both fair and reasonable. He thought, too, that the Improvement Committee should extend their area of improvements, which had been rather limited of late. From what he had stated in reference to an increased consumption of gas, it would be supposed that the Gas Committee ought to have a still larger sum to dispose of for improvements, &c.; and so they would if the price of gas and their expenses had remained the same. But the Council would remember that on the 1st of January, 1878, the price of gas was lowered 4d. per 1000 feet. He thought the Council had never heard elsewhere of 21-candle gas at 3s. per 1000 feet, and when the facts contained in the report were taken into consideration, it would be seen that Manchester gas really cost the ratepayers little more than 2s. 2d. per 1000 feet. A reduction of 1d. per 1000 feet made a difference of £8000 in the annual profits. The reduction above mentioned was only felt for six months of the previous year, while the whole of last year's gas supply was at the reduced price. Then the Committee had had this year, for the first time, to pay a sum of £1800 for rent of offices, £9847 for public lighting and repairs to lamps, £1386 7s. 2d. extra for income-tax, and £2466 18s. 9d. under a new rate for street-mains; making a total of £32,500 5s. 11d. Although they had had this sum of £32,500 against them, the Committee were paying over to the Improvement Committee the largest amount they had ever paid in one year. Last year 10 per cent. on £120,000 of unproductive capital (£12,000) was included in the payment to the Improvement Committee. According to the agreement come to in 1868, this ought not to have been paid, because the capital was unproductive. It was never intended that the Gas Committee should pay 14 per cent. on unproductive borrowed money—4 per cent. interest and 10 per cent. to the Improvement Committee. Some persons thought the Corporation should make no profit on their gas-works, but that they should give the consumers all the benefit by lowering the price so as just to cover the actual cost of production, though shareholders in private companies might have their 10 per cent. If the terms "gas consumer" and "ratepayer" meant exactly the same thing, he could assent to this proposition. But they did not. The gas consumers, as such, had no right to expect the Corporation to sell them gas at a less price than they could buy it at from a privato company or make it for themselves. The gas-works belonged to the ratepayers, whose property was mortgaged for the gas debts. The members of the Council were elected first of all to look after the interests of the ratepayers as such, and then to do what they could for the gas consumers.

Mr. Harwood (Deputy-Chairman of the Gas Committee) seconded the motion.

The Mayor said he was reluctantly compelled to move an amendment. As he was Mayor, he should not have done so but for the circumstance that he was also Chairman of the Improvement Committee, whose interests were deeply interwoven with those of the Gas Committee. He was not taking exception to the whole of the report, but only to one small part of it—viz., a very innocent-looking paragraph, but which he considered had the seeds of mischief in it, and which was calculated, if endorsed by the Council, and voted upon by the Committee hereafter, to produce most disastrous results, and throw the finances of a portion of the Council's affairs into confusion. The paragraph read as follows:—

> In concluding the notes upon the accounts, it may be as well to draw attention to the fact that it has been decided to place the sum of £52,000 at the disposal of the Improvement Committee, but it is a question for careful consideration whether the Council would sanction the payment by the Committee of so large a sum for improvement purposes another year, since the £52,000 includes interest on unproductive capital to the extent of £12,000, which, in the opinion of the Committee, should be deducted, and, further, the payment of such a sum would prevent the desired reduction in the price of gas.

He thought the policy suggested in that paragraph involved consequences too important to be dealt with in a paragraph at the bottom of the report, because it went directly to assail literally the policy which had hitherto been pursued and sanctioned by the Council. The Committee stated that the reason why they would act in the way proposed was because there was a certain amount of capital which at present was unproductive; but he should wish to ask the Committee when in their history there had been a time when there had not been a considerable amount of unproductive capital from works and extensions always going on. The distinction between works actually in operation and works going forward had never before been made in the history of the gas-works or of the Corporation. It was a new distinction entirely. Moreover, it required some little—he was going to say assurance to suggest that to £12,000 of what was paid over to the Committee some exception might be taken, while the report said nothing, in that connection, of the circumstance that an expenditure of £10,000 had been voluntarily undertaken by the Committee in the lighting of the street-lamps, and which they said next year would be increased to £25,000. If the Committee had not done an illegal and improper thing, which would encroach upon their funds to the extent of £25,000, there would have been no occasion to make a weak plea about unproductive capital. The Council decided upon a course of action in 1868, in order that the amount to be paid over to the Improvement Committee might not be subjected to the fluctuations experienced in former years, and to this present it had been rigidly adhered to. It was decided that the amount should always be a sum equal to 10 per cent. of the capital employed. The Improvement Committee, on the strength of this long-standing arrangement with the Gas Committee, had borrowed money to the extent of £1,176,000 for public improvements, and the Committee had no resources from which to pay the annual interest on that amount, together with their other expenditure, except their receipts from the Gas Committee. He might state that if the Council's instructions had been adhered to, the amount handed over would have been £56,000 instead of £52,000. The total income of the Improvement Committee last year was £61,500, and there was a deficiency to be made up upon the year's accounts, for which they did not know where to look, of £4013; but if the Gas Committee had followed the instructions of the Council, and paid over to the Improvement Committee the agreed amount, the income this year would have exactly balanced the expenditure. He concluded by moving that the report be approved, with the exception of the paragraph which he had read.

Alderman Thompson seconded the amendment. He said the suggestion of the Gas Committee seemed rather like a repudiation of an engagement. If the resolution of 1868 meant anything, it meant that the 10 per cent. to be handed over was to be 10 per cent. upon the capital employed in any way, whether productive or unproductive. It would be a fatal thing to touch this engagement, upon the strength of which the Improvement Committee had undertaken works and borrowed money.

After a few words from Alderman Hopkinson and Mr. Goldschmidt in support of the amendment,

Mr. Harwood said the circumstances of the two Committees were wholly different now from what they were in 1868. The Mayor had said that the Improvement Committee had undertaken certain responsibilities, and borrowed so much money. He (Mr. Harwood) wanted to ask how much unproductive property the Improvement Committee had—how much land they held which they might have put into the market years ago and sold at a maximum price. He should say that they had unproductive property representing a quarter of a million of money. Let the Improvement Committee part with their own money first before they came to the Gas Committee to ask for money. No doubt in 1868, when the Improvement Committee were receiving from the Gas Committee about £16,000 a year, it was right that 10 per cent. should be paid; but the circumstances were altogether different now. The benefits to the community which were conferred by the Improvement Committee were of limited extent, whereas the policy of the Gas Committee conferred benefit upon the whole of the ratepayers, even to the poorest. The remission of £25,000 in gas charges, recently effected by the Gas Committee, was a benefit to the poorest inhabitants. He urged the Council not to interfere with a policy which had in view the greatest benefit to the greatest number.

After some further discussion, Alderman Lamb, in reply, said there was nothing in the clause which bound either the Council or the Gas Committee. It only suggested that it should be a question for consideration whether another year they would give so much to the Improvement Committee. In his opinion the action of the Gas Committee was quite in accord with the resolution passed in 1868, which was that the Improvement Committee should receive "the sum of 10 per cent. upon the capital employed in the manufacture of gas." He thought that did not mean 10 per cent. upon the whole of the capital, productive and unproductive. However, he was willing to withdraw the clause with the consent of his colleagues.

The other members of the Committee objecting to this course, the Council divided, and the amendment was carried by 29 votes to 19.

Alderman Curtis then raised the question of the legality of devoting part of the gas profits to the payment for street lighting, instead of the whole to the improvement of the city, as required by Act of Parliament. He pointed out that in 1844 an Act was passed setting forth that the only purpose to which the profits could be applied was the improvement of the township of Manchester. Subsequently, when the townships were amalgamated, the Act was amended so that the words "city of Manchester" were substituted for "townships of Manchester." It seemed to him that the Council had no choice in the matter; that they must do one of these two things—either conform to the Act of Parliament, or, if they had come to the conclusion that it was desirable to apply a portion of the gas profits to the lighting of the public lamps, make application to Parliament for power to do so. He therefore moved—"That as the surplus of the gas-rents and profits are by Act of Parliament to be applied towards the improvement of the city of Manchester in such manner as the Council or the Improvement Committee shall think proper, and therefore cannot be applied to defray the expense of the supply of gas to the public lamps in the streets, or the lighting and extinguishing of the same, the annual report of the Gas Committee be referred back, with instructions to alter and amend the same by charging all the expense connected with the supply of gas to the public lamps and of lighting and extinguishing the same to the city fund."

The amendment was seconded by Mr. Goldschmidt; but, on a division, the debate on the motion was adjourned for a fortnight.

Sale of Sevenoaks Gas Company's Shares.—On Tuesday, the 23rd ult., 17 fully paid-up £10 shares in the Sevenoaks Gas Company were sold by auction for £335.

Darlington Corporation Gas Supply.—At the meeting of the Darlington Town Council last Thursday, Alderman Kitching, Chairman of the Gas Committee, stated that the net profit on the gas-works for the past half year amounted to £532. During the six months the Committee had endeavoured to decrease the expenses of the department, and in coals alone they had saved £7061 7s. 11d.—coals being in 1878 12s. 6½d. per ton, while last half year they cost only 9s. 10½d. Rates and taxes were £45 10s. 3d. less; and in stokers wages a saving had been effected to the extent of £126 7s. 6d.

Leicester Corporation Water Supply.—At the quarterly meeting of the Leicester Town Council last Tuesday, the Water Committee reported that the net profit for the last half year, ending June 30, after paying the interest on the mortgage debt and dividends on debenture stock issued as the consideration for the purchase of the concern, was £1442 4s. 5d. Out of this sum had been paid £767, being the half year's amount for sinking-fund on the original capital debt of £452,434, leaving a balance of £675 4s. 5d., which had been paid to the credit of the general district fund. Alderman Paget, who moved the adoption of the report, said there was an increase in the income from house-rentals, for the half year, of £328 14s. 6d., which was the natural increase from the growth of the town, and which they might expect to continue. On the other hand, there was a decrease from meter-rentals of £331 17s. 9d. as compared with the last half year, arising from depression of trade. The net profits for half year were £1442 14s. 5d., and for the previous half year £1454 18s. 3d., making nearly £3000 for the year. The motion was seconded, and carried.

Barff's Process for Preserving Iron from Rust.—On the 26th of last March, Professor Barff, M.A., read a paper before the Society of Arts, "On the Treatment of Iron to Prevent Corrosion," in which he described his patented method that obtained two gold medals at the Paris Exhibition, 1878. The Rustless and General Iron Company (Messrs. James E. and Samuel Spencer), of 97, Cannon Street, are now manufacturing and treating iron goods by the process, which shortly consists of passing superheated steam over the metal whilst at a red heat. It can be applied to all kinds of ironwork, rendering it rustless at a less cost than galvanizing, so substituting an absolute protection for one which confessedly is but partial in its action, and easily removed. Amongst the "anti-corrodo" goods, wrought-iron tubes stand out prominently, as they afid a host of similar things are peculiarly well adapted for the application of Professor Barff's process, and Messrs. Spencer have an iron chamber, 12 feet long, specially built for treating this class of goods, whilst a chamber 7 feet × 8 feet × 12 feet, which was built to coat a quantity of large iron railings for the Duke of Norfolk, enables them to treat all kinds of ironwork of any ordinary dimensions for manufacturers and others interested in the process. From results of tests made on the works of Sir Joseph Whitworth it is shown that the iron is slightly improved in strength by the process. Many of the articles first treated are in Messrs. Spencer's possession. Although they have been exposed to the severest of tests by various firms and gentlemen, in whose possession they have been in some cases over two years, they present no appearance of corrosion, and are, as claimed for them, rustless and incorrodible.

ALLIANCE AND DUBLIN CONSUMERS GAS COMPANY.

The Half-Yearly Meeting of this Company was held last Tuesday—EDWARD FOTTRELL, Esq., J.P., in the chair.

The SECRETARY and MANAGER (Mr. W. F. Cotton) having read the notice convening the meeting, the following report was taken as read:—

The Directors herewith submit the annexed statement of accounts and balance-sheet for the half year ended the 30th of June last, duly audited and certified.

The gross revenue derived from the half year's working amounts to the sum of £122,584 12s. 7d., the expenditure (including interest) during the same period being £90,126 14s. 9d., leaving an available balance of £32,457 17s. 10d. applicable to dividend, from which the Directors recommend payment at the rate of 10 per cent. per annum, free of income-tax. After the payment of dividend, a sum of £2957 17s. 10d. will remain to be added to previous balances, making a total sum to be carried to next account of £35,362 12s. 7d.

The Directors have taken advantage of the present depressed state of the iron market, and have ordered a large quantity of pipes on most favourable terms.

In order to meet the increased demand for gas, and to place an ample supply at the disposal of the consumers, they have decided to substitute for the present 24-inch feeding-main, which runs from the works through Great Brunswick Street to Carlisle Bridge, a 36-inch, and to relay the 24-inch on the South Quays in lieu of the existing 16 and 18 inch. This work will be commenced early next spring.

The Bill promoted by the Company in the last session of Parliament, received the Royal Assent on the 24th day of July. In addition to other powers obtained by that Act, the Company are empowered to manufacture, sell, and let by hire cooking and heating apparatus, also gas-engines. The Directors are making preparations to enter upon this business, from which, judging by the experience of other Companies, they are led to believe great advantages will accrue to the Company and consumers. In a few weeks they will be in a position to supply the apparatus necessary.

DR.—*Capital Account, for the Half Year ended June* 30, 1879.

—	Expended this Half Year.	Total to June 30, 1879.
Expenditure to Dec. 31, 1878	..	£718,240 3 4
Expenditure on manufacturing plant, machines, storeage works, and other structures connected with manufacture (not in place of old ones)	£873 18 3	
New mains and service-pipes (not being in place of old ones), including laying same, paving, and other works connected with distribution	883 2 11	
New meters (not in place of old ones), including fixings, &c.	881 19 4	
Horses, carts, &c.	143 4 0	
Parliamentary expenses	2,133 15 0	
New purifiers	4,625 16 10	
		9,541 16 4
Total expenditure	..	£727,781 19 8
Balance of capital account	..	9,662 10 4
		£737,444 10 0

CR.—*Capital Account.*

—	Certified Receipts to Dec. 31, 1878.	Received during Half Year.	Total Receipts to June 30, 1879.
Share capital	£589,892 10 0	£52 0 0	£589,944 10 0
Bonds	137,000 0 0	10,500 0 0	147,500 0 0
	£726,892 10 0	£10,552 0 0	£737,444 10 0

DR.—*Revenue Account.*

To Manufacture of gas—		
Coals, including dues, carriage, unloading, and all expenses of depositing same on works	£54,394 10 1	
Purifying materials, oil, water, and sundries at works	692 17 11	
Salaries of Engineers, including Chief Engineer, Superintendents, and Officers at works	1,516 19 2	
Wages at works	8,414 15 4	
Repairs and maintenance of works and plant (including renewal of retorts), machines, apparatus, tools, materials, and labour	7,516 8 9	
	£72,529 11 3	
Less old material sold	238 2 3	
		£72,291 9 0
Distribution of gas—		
Salaries of Surveyor, Chief Inspector, Inspectors, Assistant Inspectors, and Clerks in light office	£1,231 11 0	
Repair, maintenance, and renewal of mains and of service-pipes, including materials, laying and paving, and labour	1,942 10 5	
Repairing, renewing, and refixing meters	1,571 2 10	
		4,745 4 3
Public lamps—		
Lighting and repairing		335 15 10
Rents, rates, and taxes—		
Rents	£654 3 1	
Rates and taxes	1,850 0 7	
		2,504 8 8
Management—		
Directors allowances	£600 0 0	
Salaries of Secretary, Accountant, and Clerks, Office-keepers, and Messengers	1,169 1 0	
Collectors commission	1,931 8 8	
Stationery and printing	224 0 4	
General establishment charges and incidentals	1,058 12 0	
Auditors	30 0 0	
		5,013 2 0
Law and parliamentary charges		210 17 9
Bad debts		628 2 9
Abatements and allowances		813 19 11
Annuity account		500 0 0
Total expenditure		£87,043 0 2
Balance carried to profit and loss account		35,541 12 5
		£122,584 12 7

CR.—*Revenue Account.*

By Sale of gas—		
Gas (423,916,800 cubic feet), at 4s. 3d., 4s. 6d., and 5s. per 1000 cubic feet	£91,951 7 2	
Public lighting and under contracts	4,338 9 2	
		£96,289 16 4
Rental of meters		2,657 19 3
		£98,947 15 7
Residual products—		
Coke, less labour and cartage	£14,917 10 4	
Breeze	864 16 11	
Tar	4,198 12 6	
Ammoniacal liquor	2,797 15 7	
		23,778 15 4
Rents		237 9 2
Transfer fees		57 10 0
Ship *Dispatch*, money received		543 2 6
		£122,584 12 7

The CHAIRMAN moved the adoption of the report and accounts. He said the results of the past half year compared very satisfactorily with those of the corresponding period last year. The revenue of the Company was larger by more than £2000. They carbonized during the six months 7000 tons of coal more than in any similar time before, and had secured 338 new customers. The residuals also showed a fair return, and, on the whole, the Directors were perfectly satisfied with the way in which the business was going on. He might mention that the works and all the plant were in excellent condition, and he did not know that a single complaint had reached the Board of the quality or of the purity of the gas. Since the last half year they had endeavoured to show the public the perfection to which gas lighting could be brought. To effect this they went to Parliament, with the permission of the Shareholders, to promote a Bill which was now an Act, enabling them to manufacture gas apparatus, and to hire it out to the public, the object being to show what gas could be made to do. It was intended to establish a show-room for the exhibition of stoves and gas-engines, which would illustrate the useful purposes gas could be made to serve. The Directors were also anxious to prove conclusively the illuminating powers of gas. No doubt the electric light made a great stir some time ago; but, as every one might now judge who visited Sackville Street in the evening and saw the new lamps erected there, gas was able to develop its power very effectively. When he stated that the large lamp put up at the head of Carlisle Bridge gave the light of 400 candles, he thought this illumination could not be eclipsed by the electric light. The other lamps erected in Sackville Street were also very powerful, though less in degree than the large lamp, and the Directors, in making this display, did so in the hope that the Corporation and other persons in power would utilize the splendid light which was at their service. In taking these steps the Directors also desired to afford the means of making a fair and just comparison with the electric light, which was undoubtedly a powerful medium of illumination. They took a great deal of trouble last session in regard to their Bill in Parliament. Several interviews were held with a Committee of the Corporation, in which the Bill was gone over clause by clause by himself and the Secretary along with the Committee. They left the Committee with the understanding that the Bill was in such a state that it should receive no opposition. However, he was sorry to say that, notwithstanding the agreement as he might call it, they were met with an opposition in Parliament, by which they were put to an expense of £700 or £800. In the Bill there were words which had been considered to constitute powers of using the electric light; but he might now inform them on the very best authority—viz., on the authority of Lord Redesdale and Mr. Raikes, the Chairmen of Committees in the Houses of Lords and Commons respectively—that, by their previous Act of 1856 and other Acts, they had the power of using electric light. He believed that they were the only Gas Company in the kingdom who had such power; and if any person in Dublin wished to have the electric light, the Company were prepared to supply it. He stated this distinctly, because a great deal had been said about their going to Parliament to get the power, and having been foiled. The words of their original Act were: "Or for any improved means of lighting," and these words they had the best authority for taking as including power to use the electric light. By the Act they had also obtained power to acquire some necessary land, as Parliament was very jealous of gas companies acquiring land *ad libitum*, it being considered that the making of gas was to some extent noxious. They had also obtained power to make a tramway, and it thus appeared that they had fully carried out what they had in view. He might be misleading the Shareholders if he allowed them to remain under the impression that the improved lamps in Sackville Street were there at any one's expense but their own. The Directors had determined to erect these lamps to show the Corporation what an improvement they would be to the city, and believing that the Corporation would adopt them. However, if the Corporation would not take them, the Directors would have them removed. In conclusion, he said they had been working during the past half year with a reduction in the price of gas, as compared with the corresponding period in the previous year; but as to any further reduction they must wait until they saw their own way more clearly. He might state, however, so that the public might know it, that the moment the Directors saw that a further reduction could be made without injuring the interests of the Shareholders, it would be carried out.

Mr. TALLON seconded the motion, and it was passed unanimously.

On the motion of the CHAIRMAN, seconded by Mr. DAVID DRIMMIE (a Director), a dividend at the rate of 10 per cent. per annum was then declared.

Mr. JAMES KENNY said he saw by the report that there was now a very large surplus—viz., £35,000. He wished to know if there was any possibility of the Shareholders—who received no dividend for two or three years—now obtaining a portion of that surplus to recoup them for their loss during that period.

The CHAIRMAN replied that it was absolutely necessary that there should be a large surplus. It would not be at all prudent, in the present state of the capital account, to lessen the sum in hand, which was absolutely necessary to carry on the business. It was for the best interests of the Shareholders and the public alike to keep the present large hanging balance.

[The High Sheriff having been called to the second chair,]

Mr. CROSTHWAITE, J.P., moved, and Mr. DOCKRELL seconded, a vote of thanks to the Chairman and Directors for their successful management of the affairs of the Company during the past half year.

The resolution was adopted.

Mr. FOTTRELL said he was very much obliged for the compliment. It would certainly be no fault of the Directors if the Company did not continue to go ahead.

Mr. J. M. BURKE, J.P., moved a vote of thanks to the Secretary and Manager and the other Officers of the Company. But for the successful exertions of their Officers, co-operating with the Directors, they would not have had the very favourable report presented that day.

Mr. DRIMMIE seconded the motion, and said he felt great pleasure in stating that the services of their staff, especially of Mr. W. F. Cotton, Mr. Waterfield (the Engineer), and Mr. Thomas Cotton, were beyond all praise, and undoubtedly had contributed largely to the prosperity of the Company.

The HIGH SHERIFF wished to bear his testimony to the great usefulness of the Officers. It would be impossible for the Directors to efficiently discharge their duties, which were very trifling compared with those of the staff, without the able services of the latter, and he believed he could say with truth that there were no officers connected with any company in the United Kingdom better entitled to their thanks than the staff headed by Mr. W. F. Cotton.

The resolution having been passed,

Mr. W. F. COTTON said he was extremely indebted to the Shareholders for the compliment paid him. On behalf of himself and the other Officers, he could assure them that they would ever seek to promote the best interests of the Company.

The proceedings then terminated.

SHEFFIELD UNITED GAS COMPANY.

The Forty-ninth Ordinary Meeting of this Company was held last Wednesday—Mr. JOHN HOBSON (in the absence of the Chairman of the Company, Mr. F. T. Mappin) presiding.

The SOLICITOR (Mr. W. Wake) read the notice of meeting, and the following report of the Directors was presented:—

Your Directors have much pleasure in presenting to you their accounts for the half year ending June 30, 1879.

These accounts show that the profits for that period (not including the balance carried over from the half year preceding) were £30,120 8s. 2d.

Your Board recommend that there shall be paid a dividend for the half year, after the rate of 10 per cent. per annum, on all the Company's paid-up capital, which will be as under, viz.:—

On £135,000 class A stock	£6,750 0 0
On £209,053 10s. class B stock	10,452 13 6
On £99,700 class C stock	4,985 0 0
On 12,937 new ordinary £10 shares (second issue), £4 per share paid up	2,587 8 0
On 11,462 E shares of £8 10s. each, £2 per share paid up	1,146 4 0
	£25,921 5 6

They also recommend that the sum of £3860 6s. 1d. be added to the reserve-fund, which will then amount to £67,055 1s., being 10 per cent. on the issued capital of the Company.

If these recommendations be adopted, the amount to carry forward to the credit of the half year now current will be £18,072 15s. 2d.

In their last report your Directors announced that they had made a reduction in the Company's charge for gas of 1d. per 1000 cubic feet, to take effect from the 1st of July. The result of the past half year's working, and the present position of the Company, have warranted them making a further reduction of 2d. per 1000 cubic feet, to take effect from Sept. 30, 1879. The price to the smallest consumer will then be only the low figure of 2s. 4d. per 1000 cubic feet.

The correctness of the expectation on the part of your Board (referred to in the last report) that streets can be lighted with gas as efficiently as by the electric light, and at much less cost, has been established here by the new Sugg burners placed in various situations in the centre of the town; and your Directors are convinced that gas shareholders have nothing to fear from competition with electric lighting, where gas can be sold, of the quality supplied at Sheffield, at prices anything like those charged by your Company.

The extensions at the works in Effingham Street are in progress.

The negotiations with the Duke of Norfolk, named at the last general meeting, have been perfected, and the Company have thereby acquired the freehold of their Effingham Street works, and the reversion in certain adjoining properties; and his Grace's trustees have obtained a portion of the site of the Shude Hill works.

Messrs. John Hobson, Edward Hudson, and James William Harrison, three of your Directors, now retire by rotation, but are eligible, and offer themselves for re-election.

Capital Account.

Receipts.

Class A stock, fully paid up		£135,000	0 0
Do. B do. do.		209,053	10 0
Do. C do. do.		99,700	0 0
12,937 new ordinary £10 shares (2nd issue), £4 per share paid up		51,748	0 0
11,462 E £8 10s. shares, created May 6, 1878, £2 per share paid up		22,924	0 0
Amount raised on mortgage	£24,800 0 0		
Less, paid off since	6,500 0 0		
		18,300	0 0
		£536,725	10 0

Expenditure.

Land, buildings, parliamentary and other expenses, works, and machinery (including mains to June 30, 1855) to Dec. 31, 1878	£429,230 11 0½		
Less received for land, buildings, and cottages, sold to the Duke of Norfolk	23,180 0 0		
	£406,050 11 0½		
Less depreciation on expenditure to Dec. 31, 1878	2,019 3 2		
		£404,031	7 10½
Ditto, extensions to June 30, 1879		717	18 5
Mains from June 30, 1855, to Dec. 31, 1878	£75,559 4 5		
Less depreciation	504 15 10		
		75,054	8 7
Ditto, extensions to June 30, 1879		1,383	16 2
Meters to Dec. 31, 1878		30,832	12 7
Ditto, extensions to June 30, 1879		68	16 0
Balance		24,636	10 4½
		£536,725	10 0

Revenue Account, for the Half Year ending June 30, 1879.

Receipts.

Gas and meter rents	£62,195	8 5
Coke, tar, waste lime, and ammonia water	17,818	9 8
Sulphate of ammonia, sale of gas-fittings, and work done (after deducting all charges) and house and other rents	3,505	1 11
Balance brought from last account	17,733	18 7
	£101,252	18 7

Expenditure.

Production of gas	£53,258	19 8
Mortgagees interest, less received from Bankers and others	139	12 2
Balance	47,854	6 9
	£101,252	18 7

Dividends payable Oct. 9, 1879	£25,921	5 6
Amount to be carried to reserve-fund	3,860	6 1
Balance to be carried forward	18,072	15 2
	£47,854	6 9

General Balance.

Balance of revenue account	£47,854	6 9	
Ledger balances, and accounts owing by the Company	29,265	10 8	
Balance of capital account	24,636	10 4½	
	£101,756	7 9½	
Ledger balances, and accounts owing to the Company	£35,702	14 9½	
Stores in hand	16,342	0 2	
Balance due from Bankers	49,709	17 6	
Balance due from Cashier	1	15 4	
	£101,756	7 9½	

Reserve-fund, invested Dec. 31, 1878	£61,950	15 6
Interest to June 30, 1879	1,243	19 5
	£63,194	14 11

The CHAIRMAN moved—"That the Directors report be approved and entered on the Company's minutes, and that a copy of the resolutions of this meeting be sent to each Shareholder." He said that the results of the past half year's working of the Company were more surprising than he had expected. It might seem rather a strong thing to say, but he assured them that during the 21 years he had been connected with the Company in the capacity of a Director, he had never had a report before him that was so satisfactory, either to the Directors or to the Shareholders. They were able to sell gas—at least such was their opinion, looking ahead as far as they thought it necessary—from that day forward at 2s. 4d. per 1000 feet to the smallest consumer; to the somewhat larger consumer at 2s. 2d. per 1000 feet; and to the very largest at 2s. per 1000 feet. His father was a Director of the Company some 40 years ago, and the price then was 8s. 4d. per 1000 feet, and he (the Chairman) little expected that he should live to see the day when gas would cost only 2s. 4d. per 1000 feet. However, such was the case; and he might congratulate the Shareholders on several matters in the report which he thought would enable the Directors to continue to sell gas at that price. In the first place, the reserve-fund was full, they were paying 10 per cent. dividend, and in addition had a floating balance. With that they would be able to extend the works to meet the increased consumption, and that, he thought, was very satisfactory. The Directors hoped that the balance would be profitably used; and if it was, the Shareholders might safely expect that a fair profit would be made upon it from the increased consumption. There was another point that ought, perhaps, to be mentioned. During the past half year they had been able to effect the purchase of the freehold of their works in Effingham Street. That was a matter which had had the attention of the Directors for the best part of 20 years, and it was with very great pleasure that they announced that their object was now effected. The extensions the Directors were wishful to make there could not well be carried out—at least, they thought it wise not to do so until they saw their way to purchase the freehold. That had been accomplished, and they had a very large and substantial block of property there. They had already commenced improvements at the place; and they were going to put down a holder capable of containing 1,200,000 feet of gas. That would be a larger holder than any they now had. The work was proceeding very satisfactorily, and when completed would be an additional means of supply to the town, as it would give the Directors more command of storeage. If they had any doubt or any fear—and some people always looked on the gloomy side of things—they might say, "Coals are now so cheap, they cannot always be at present prices; you will have more to pay for coals." He had no doubt colliery proprietors would be very glad if they had more to pay for coals. The Shareholders, however, would recollect that it was only six or eight years ago, when gas was selling at 3s. 1d. per 1000 feet, and coals went up from 100 to 150 per cent. in price, yet the smallest consumer of gas during those two or three years never had the price raised to him at all. The Company continued to sell during all that period at 3s. 1d. per 1000 feet; and that was owing in some measure to the Company being able to get much more for their coke. In order not to disturb the friendly arrangement that existed between them and their customers, they took a few thousands out of their reserve-fund, and by doing so they were able to tide over what he might term the famine prices of that day. Having done this once—and he thought most of them would say that the price of coals was not very likely to go up to what it was in 1872-73—he trusted the Shareholders had such confidence in the future as to believe that a similar course might be pursued again. The Directors could not control events, and if it should happen that coals should cost again what they did before, they would then judge what had best be done. With a full reserve-fund and a balance to carry forward such as they had never had before, he had no fear as to the thing going forward and prospering. During the past half year, owing to the long winter and the cold summer, the consumption of gas had been considerably in excess of what it had been previously; and having regard to the price at which they were able to produce and sell it, they looked forward to a largely-increased consumption. On the whole, the business had been carried on—and he trusted the Shareholders joined with him in thinking so—in a most satisfactory manner.

Mr. J. WILSON reminded the Chairman that he had not touched upon the electric light this time. He should be glad to hear something about it. He also asked whether the large lamps in the centre of the town had been put up at the expense of the Company or of the Corporation.

The CHAIRMAN replied that Mr. Wilson would find the electric light referred to in the report.

Mr. WILSON said he also wanted to know about the special lamps.

The CHAIRMAN: They are put up by the Company.

Mr. WILSON said they would be very glad if the Directors would extend their generosity, and put up a few more. They were a wonderful improvement, and he thought the Company could afford to do it.

The CHAIRMAN: I thought we had already done a liberal thing.

Mr. WILSON observed that he only asked the Directors to extend their liberality. He hoped the Directors would take the matter into their consideration, and he should be very glad if they could see their way to carry out his suggestion.

The CHAIRMAN said the Directors had put up these lamps, and not charged or even asked the Corporation for a penny for them; but he did not think they were called upon to light up half a dozen other public places free. The Directors had done what they had to prove their ability to supply large lights if required to do so. With respect to the electric light, he said he had not sold a single gas share, but had bought more. This was his answer on that point.

The resolution was then carried.

On the motion of the CHAIRMAN, the dividend was sanctioned.

Mr. S. ROBERTS moved that Mr. John Hobson be re-elected a Director of the Company.

Mr. J. WILSON seconded the motion, and it was carried.

Mr. HOBSON, in acknowledging the vote, said it was 21 years since he first joined the Board, and in receiving a renewal of the Shareholders confidence it would be his endeavour to do the best he possibly could to promote the interests of the Company.

Mr. Edward Hudson and Mr. J. W. Harrison having also been re-elected Directors, the usual vote of thanks to the Chairman concluded the business of the meeting.

REDUCTION IN THE PRICE OF GAS AT PLYMOUTH.—Notice has been given by the Plymouth and Stonehouse Gaslight and Coke Company that from the date of reading the meters for the Michaelmas quarter the price of gas will be reduced to 2s. 2d. per 1000 cubic feet.

REDUCTION IN THE PRICE OF GAS AT WEXFORD.—At a meeting of the Directors of the Wexford Gas Consumers Company, Limited, on the 26th ult., it was resolved to reduce the price of gas from 4s. 6d. to 4s. 3d. per 1000 cubic feet, free of meter-rent. The reduced price to be reckoned from the 1st of July last.

ALLEGED POLLUTION OF THE SHEFFIELD WATER SUPPLY.—An investigation is, says the *Standard*, now proceeding in Sheffield, relative to the pollution of the water in the distributing reservoirs near the town, and the attention of the Local Government Board has been called to the matter. Originally there were large surplus lands around the distributing reservoirs in Crookesmoor Valley, but Sheffield has grown to such an extent within recent years that the land has now been built upon, and the sewers from these houses run near the reservoirs. According to the Medical Officer of Health, some of the sewerage pipes have fractured, and an analysis of water taken out of one of the slopes near the reservoirs proved that it was largely permeated with sewage. The Water Company contend that the waters in the reservoirs cannot be polluted, as they contain quantities of fine fish; but the correspondence has been sent to the Local Government Board, drawing their attention to the grave cause of peril to the public health by the threatened pollution of reservoirs from sewers in close proximity to these waters.

SALE OF SHARES IN THE BURY ST. EDMUND'S GAS COMPANY.

On Thursday, the 25th ult., there were sold by auction at Bury St. Edmund's 115 shares in the local Gas Company, and the price realized for them is a very convincing proof that the electric light has not altogether scared speculators in that district; on the other hand, they seem to have gone almost too far in the opposite direction, and given more for the shares than they were really worth.

Of the shares sold, 100 were issued under the provisions of the Act the Company obtained in the last session of Parliament. Established in 1849, the Company had power to raise £12,000 with a 10 per cent. dividend, and borrow £4000 on mortgage. Of this latter amount, the sum of £2500 only was borrowed of the late Paving Commissioners, without interest, on condition that the public lamps of the town should be supplied with gas by the Company at cost price; and this arrangement is still in force. In 1859 the Company obtained a second Act, authorizing them to raise £18,000 more by the issue of shares, bearing a dividend of 7½ per cent. Their Act just passed allows the raising of a further sum of £20,000 with a 7 per cent. dividend, subject to the sliding scale; while auction clauses were also, of course, imposed. The charge for gas now is 4d. per 1000 feet below the standard price, thus allowing 1 per cent. additional dividend on all classes of shares. The progress of the Company may be shown by quoting the sale of gas, which in 1868 was 19,412,000 feet, increasing in 1873 to 23,240,000, and last year to 30,894,000 feet.

The Secretary of the Company (Mr. W. Salmon) having read the clauses in the Act of Parliament under which the sale was held,

The Auctioneer (Mr. G. A. Simpson) offered the first lot of 5 £10 new shares. The bidding started at £13 per share, and was kept up well to the close of the sale, when the result was as follows:—15 shares sold at £16 each; 48 at £16 2s. 6d.; 31 at £16 5s.; 4 at £16 7s. 6d.; and 2 at £17. The £1000 thus realized premiums amounting to £617 5s.

Afterwards 6 original £10 shares were sold—3 at £23, and 3 at £23 10s. each; and 9 £10 shares issued under the Act of 1859—5 at £17 2s. 6d., 2 at £17 5s., and 2 at £17 7s. 6d.

LEICESTER CORPORATION GAS SUPPLY.

The Quarterly Meeting of the Leicester Town Council was held last Tuesday—the Mayor (Alderman C. Stretton) presiding—when the following report of the Gas Committee was received:—

The Gas Committee have to report that the accounts of the undertaking for the half year ending the 30th of June have been submitted to them, from which it appears that the net profit, after paying interest on the mortgage debt and dividends on the debenture stock issued as the consideration for the purchase of the concern, and upon the new stock issued, is £6775 7s. 2d. Out of this sum has been paid £1002, being the half year's amount for sinking-fund on the original capital debt of £476,651 12s. 6d., leaving a balance of £5773 7s. 2d., which will be payable to the general district fund at the close of the current financial year.

Your Committee feel that this balance-sheet justifies them in recommending that there should now be a reduction made in the price of gas, and they submit the following scale of charges for the approval of the Council, which they recommend should come into operation from the current Michaelmas inspection of meters:—

Proposed Revised Scale.

District, &c.	Present Price.		Proposed Price.		Reduction.
Leicester	2s. 10d.	..	2s. 8d.	..	0s. 2d.
Ditto	2 9	..	2 8	..	0 1
Ditto	2 8	..	2 8	..	—
Ditto Midland Railway Company	2 6	..	2 6	..	—
Ditto Public Lamps	2 6	..	2 6	..	—
Ditto Private Lamps	2 10	..	2 8	..	0 2
Stonygate	2 10	..	2 10	..	—
Ditto	2 9	..	2 10	..	—
Ditto	2 8	..	2 10	..	—
Ditto Lamps	2 10	..	2 10	..	—
Belgrave and New Humberstone	3 4	..	3 0	..	0 4
Ditto (Asylum)	2 8	..	2 8	..	—
Ditto Lamps	3 4	..	3 0	..	0 4
Oadby and Knighton	3 4	..	3 4	..	—
Ditto Lamps	3 4	..	3 4	..	—
Aylestone Park	3 4	..	3 4	..	—

This proposal, if adopted, would have the effect of fixing a uniform price for all gas supplied in the borough, whether the consumption be large or small, with two exceptions, namely—the Midland Railway Company and for the public lamps, both of which it is proposed should continue to be charged 2s. 6d. per 1000 feet.

It has been the custom in Leicester, as in most other large towns, to charge a somewhat higher price for gas supplied beyond the limits of the borough. Hitherto the suburban district of Stonygate has been an exception to the rule, and this has not unnaturally caused some dissatisfaction in other outlying districts, which are more populous. With the view of ultimately abolishing this anomaly, your Committee recommend that no reduction should be made in the price to be charged to the consumers in the Stonygate district, but that they should be charged 2s. 10d. per 1000 feet, whether they are also large consumers in the borough or not.

Mr. Downing moved the adoption of the report. He said the Committee had especial pleasure in presenting with it the second half year's balance-sheet, which was of a most satisfactory character. Turning to the net results, it would be found there had been a clear profit on the half year of £5773 7s. 2d. after paying all demands, and this, in due course, would be transferred to the credit of the district rate—either to lessen or keep down the rates. The year's profits had been £37,893 15s. 3d.; but then they had to deduct the interest, amounting to £19,974 18s. 4d.; the payments on the sinking-fund account, £2004; special payments connected with the transfer, £2446 15s.; parliamentary expenses, £350; reserve-fund, out of first half year's revenue, £5000; payments to the district rate in the first half year, £2344 14s. 9d.; leaving the £5773 7s. 2d. to be transferred to the same fund in due course. The total quantity of gas consumed was over 535 million cubic feet, showing an increase of 10·94 per cent. on the previous twelve months. This was in excess of the estimated increase, attained partially through the excessively cold winter. In 1870 the quantity of gas made was 262,723,000 feet, so that in eight years the quantity had been nearly doubled. The largest daily consumption last year was on December 20, when it amounted to 3,169,000 cubic feet, showing an increase on the estimate prepared by Messrs. Robinson, who gave the probable amount at 3,141,000 feet. It must be remembered that trade was in a depressed condition, but it was only fair to presume that trade would ere long revive, and bring its quota of increased demand, and reveal a commercial necessity which would be met by the new works. Bad debts was an item, even in gas, that was sure to occur, and especially in bad times; but it was satisfactory to the Committee to know that they had only been slightly increased during the past twelve months. As to the future, the Committee recommended a reduction in the price of gas, which meant in the aggregate a saving to consumers in the borough itself, according to the consumption during the past twelve months, of £3500, and a saving to those in Belgrave and New Humberstone of about £243—in all, £3740. The Committee had carefully considered the reduction in the light of the undeveloped charges on the new works—which included the interest on new outlay, the interest on the Freemen's land, the rectification of the accounts with the Estate Committee in connection with the 18½ acres of land which the new works stood upon, the management and working of the new works, the rates and taxes on them, the sinking-fund on the new capital, and the present low price of coal and the small rates which were obtained for coke—but they could with confidence recommend its adoption by the Council. The new works had progressed very satisfactorily, and would, he anticipated, be in a sufficiently advanced state to be opened early in November. By transferring some of the staff from the old works, they would be enabled to meet all the first requirements without any large increase of expenditure in that department. The financial matters had, of course, given rise to much anxiety in the minds of the Committee, but, through the action of the Finance Committee, that had been relieved, and it proved to them that Corporation stock was now rising in the esteem of the public generally. They had had under consideration the desirability of establishing an exhibition of gas apparatus, which they thought would be a great advantage to the town, and a Sub-Committee had been appointed to deliberate further upon the matter. Such, then, was their first year's experience, the results of which even more than justified what were thought by some to be too sanguine expectations. He hoped the gas-works would for years to come remain under good management, and that they would produce large funds to keep down the rates and effect town improvements.

Mr. Holyland seconded the motion.

After a short discussion as to the differential rates proposed for the outlying districts, to which Mr. Downing replied that if gas-works had been built to supply Aylestone Park only, the price, instead of being 3s. 4d., would have been 6s. per 1000 feet, the motion was carried.

THE ELECTRIC LIGHT.

The Editor of the *Mechanics Magazine* says: "The public have experienced so many disappointments respecting this light, it has been so often represented as attended with 'perfect success,' without that perfect success ever leading to its practical adoption anywhere, that people have fairly enough begun to regard with exceeding incredulity any announcement respecting it. We do not hesitate, nevertheless, to present our readers with an account of one exhibition more, which has been communicated to us by a correspondent on whose judgment and impartiality we place great reliance; for it does appear from it that all the difficulties of the case have at length been really surmounted, and an actual electric lamp produced, which gives a steady, enduring, and most brilliant light, without any perceptible flickering or intermission. On Monday last there was an exhibition at Crosby Hall of Mr. Staite's electric light, which demonstrated more decisively than has ever yet been done, the capability of its application to domestic and public illuminating purposes. Mr. Staite made use of a regulating magnet on the plan fully described in the *Mechanics Magazine*, Vol. L., p. 48, and most admirably did it perform its functions. In addition to the advantage of being self-acting, this apparatus is so sensitive of the slightest variation in the electric current, and so instantaneous in its controlling action, that no unsteadiness of light is perceptible. Mr. Staite also exhibited a small iridium lamp, in which the illuminating medium was composed, as the name indicates, of iridium, and which appeared to be particularly applicable to domestic and other purposes, where a very powerful light is not required, but one that will last long without attention, and be of little cost. Another lamp, in which carbon points were employed for producing the light, was subsequently exhibited, and certainly for steadiness and brilliancy it surpassed every other known artificial light—so powerful, indeed, that the eye could not look upon it without being painfully fatigued. To counteract this to some extent, it was enclosed in an enamel glass globe of about 24 inches diameter, which appeared as an enormous globe of pure and brilliant white light. There can be little doubt that ere long we shall see gas and oil lighting, with all their attendant evils of blacks, heat, &c., replaced, at least in all large public buildings and thoroughfares, by the electric light."

The above which reads like a paragraph of yesterday, was published in the *Family Herald* of the 2nd of February, 1850, *nearly 30 years ago!!!*—and it seems likely a very similar paragraph may be read 30 years hence.

LEEDS CORPORATION WATER SUPPLY.

Commencement of the Eccup Reservoir.

As mentioned in last Tuesday's Journal, on the previous day the ceremony of cutting the first sod of the Eccup Reservoir was performed by Alderman Croft, the Chairman of the Water-Works Committee.

Alderman Gaunt, in presenting to Alderman Croft a silver spade which had been subscribed for by the Water Committee for use on the occasion, said it was now about 12 or 13 years since the Council contemplated taking water from the Washburn Valley, whence this reservoir would be filled. At one time there was a doubt whether the valley would supply sufficient water for Leeds; but within about 16 hours of the first rain after its completion, the first reservoir was filled to overflowing, and in the course of the following week as much water passed over the bye-wash as would have supplied Leeds for three years. The Lindley Wood reservoir was commenced in August, 1869, and was completed in November, 1875. It covered 114 acres, cost £198,928, and contained 750 million gallons. It was built for the purpose of supplying to the riparian owners compensation water for what was taken from the waters of the valley; and it was only after 10 million gallons had been passed down that the Council could take 5 millions. The second reservoir, that of Swinsty, cost £162,000, covered 157 acres, and contained 960 million gallons. It was commenced in February, 1871, and completed in January, 1877. It was out of this reservoir that Leeds had been drawing its supply for about two years past. The third reservoir at Fewston, which was now being completed, was commenced in July, 1874. It covered 150 acres, cost £146,557, and contained 860 million gallons. The reservoir at Eccup, of which the first sod was now about to be cut, was expected to be completed in between three and four years. It would include 195 acres, contain 1400 million gallons, and cost probably about £80,000. The total number of gallons which the Corporation would thus have storeage for was 3970 million; but deducting from this the capacity of the Lindley Wood reservoir, there would still remain a storeage of 3220 million gallons. Eccup reservoir alone, at the present rate of consumption in Leeds, would store sufficient water for a supply of at least 20 weeks, free from all risk of accident or drawbacks in the gathering-ground, or between it and the site of the new reservoir.

Alderman Croft, having cut a barrowful of sods and wheeled them away, said it had given him much pleasure to take part in this important ceremony, and he believed the result of it would be of great value, not only to the present, but to future generations. It was a great satisfaction to reflect that in 40 or 50 years the water-works would be without debt, and that there would arise from them, at the present rate, a revenue to the borough of something like £60,000 a year, which might be used for other improvements. He had been connected with the water-works for between seven and eight years, and had been Chairman of the Water Committee for about three years and a half. He had a first-class Committee, and was much indebted to them, especially to the visiting section, for their valuable and kind assistance, and he hoped they would all be spared to see 1400 millions of gallons of water enclosed in the circle of the surrounding hills. When all their reservoirs were completed, they would have 15 months supply of first-class water for the town, strangely con-

trasting with the time when the water supply for the borough used to be pumped out of the River Aire, near to Leeds Bridge; while he himself remembered the time when wooden pipes were used.

Mr. R. M. CARTER, as first Chairman of the Water Committee, expressed his satisfaction at the day's ceremony, and the warm interest which he had long taken in this splendid scheme of water supply. He estimated that the Washburn supply, as compared with the water from the Wharfe, saved the inhabitants of Leeds between £50,000 and £70,000 in three items alone—viz., tea, soap, and the wear and tear of clothing. He had no hesitation in saying that Leeds water was now cheaper and better than that enjoyed by any large town in the kingdom.

The Company then adjourned to luncheon, where Alderman CROFT presided. After the loyal toasts,

Alderman BOOTHROYD proposed—"Success to the Leeds Water-Works." After some allusions to the early history of Leeds, in contrast with its present position, he referred to the drought of 1851, and the purchase of the water-works in the following year by the Corporation, at a cost of about £227,000. Ten years ago Alderman George turned the first sod of the reservoirs in the Washburn Valley, and now, he said, they had witnessed the beginning of what might be called the final chapter of the great enterprise. The storeage which the new reservoir would give would be large enough to yield a gallon for every man, woman, and child on the face of the earth. The entire cost of the whole water-works undertaking would be about 1¼ millions sterling. Referring to the extreme cheapness with which water was supplied to the borough, he said it was delivered carriage paid at about 1½d. per ton, which he thought would put the Railway Companies to blush, even so far as carriage alone was concerned. A man who paid 3s. or 4s. per week for rent of his house might have an abundant supply of water for all the purposes of himself and his family for about 1¼d. or 1½d. per week.

The CHAIRMAN, in responding, said it was his intention to devote much time and attention to the valuable work which they had that day commenced.

Mr. JACKSON proposed "The Health of the Engineer." He said that, having been Chairman of the Parliamentary Committee at the time of the promotion of the Bill for this new reservoir, he had ample opportunity during that anxious time of observing the extreme value and devotion of the services of Mr. Filliter. Of all the witnesses who gave evidence, not only before the Committee of the House of Commons, but also in the subsequent arbitration before Sir Henry Hunt, none put the case for the Corporation so clearly, so strongly, and, at the same time, so fairly as that gentleman. There was no doubt that the Washburn scheme had cost a great deal of money; but, on the other hand, it was an undoubted fact that Leeds was now, and would be in the future, supplied abundantly with water of a quality superior to that of most towns, and inferior to none. Of all the Washburn scheme, the Eccup reservoir—the idea of which had originated with Mr. Filliter—was the most important and most complete part. Having the highest confidence in the ability and conscientiousness of their Engineer, he had much pleasure in proposing his health.

Mr. FILLITER, in responding, referred to the cost of the works. He said that he was most anxious not to exceed the estimates, and these times were undoubtedly favourable—with materials cheaper and the price of labour falling—to enter upon large works. At the same time he would not neglect the still more important consideration of stability. Some additions, as they knew, had already been made which would increase the cost beyond the original intention. The Committee had decided that the embankment should be raised 5 feet above the level authorized in the parliamentary plans, which would be equivalent to gaining an additional storeage of water to the extent of 250 million gallons, bringing up the original idea of 1250 millions to 1400 million gallons, at an additional cost of probably £10,000. In Alderman Croft the Committee had a Chairman of practical experience in work of that kind; and he (Mr. Filliter) must also acknowledge the valuable assistance of his colleagues—especially Mr. Matthewman, the Secretary, and Mr. Brooks, the Manager at the construction works.

This concluded the proceedings, and the company shortly afterwards returned to Leeds.

FAILURE OF THE BOOTLE WELL-BORING EXPERIMENTS AT LIVERPOOL.

At the Fortnightly Meeting of the Liverpool Corporation Water Committee, on Monday, Sept. 29, the ENGINEER (Mr. G. F. Deacon) submitted the following report:—

On the 4th of April, 1877, Messrs. Mather and Platt, of Manchester, entered into a contract with the Corporation to bore a hole on the site of the existing works at Bootle, 1000 feet deep, and to supply engines and place pumps within the bore, 400 feet from the surface, capable of drawing from it a daily supply of 1,428,000 gallons. By the use of their patent apparatus for separating the upper water from the lower, the Contractors promised that the yield of the old well should not be influenced by pumping from the new well. In his letter, dated March 2, 1877, to the Chairman of the Water Committee, the Engineer expressed his conviction that by pumping from the new well the yield from the old well would be greatly diminished. He also anticipated an increased proportion of chlorides if large volumes of water were pumped from so great a depth.

The boring having been completed to a depth of 1000 feet, Messrs. Mather and Platt wrote on July 30, 1878, that there were "practically three great impervious divisions passed through—first, at 268 feet from surface; secondly, at 636 feet from surface; thirdly, at 806 feet from surface." And on the 2nd of August, 1878, they wrote: "We have so far met with even greater success than we anticipated, and every foot bored deeper will, we believe, largely increase the resources for a better water supply." By the instructions of the Water Committee, the Engineer reported upon this letter on the 26th of August, 1878. In this report he differed entirely from the conclusions arrived at by the promoters of the works with respect to the success of the undertaking up to that time, and made the following observation:—"After closely examining the whole of the strata passed through in conjunction with the other records made during the progress of the boring, the Engineer sees no reason to change the opinion expressed before the work was commenced—that the proposed apparatus, wherever placed, is not likely to prevent the pumping in the new bore-hole from ultimately influencing the yield of the old well." On the 30th of August, 1878, Messrs. Mather and Platt wrote: "We are quite satisfied that the yield of water below 640 feet from the surface will far exceed the lifting power of the pumps—that is, the rocks lying from 640 to 1000 feet contain an ample supply." The depth of bore-hole exposed for percolation between these points would have been 360 feet.

In order, however, to test the principle to its fullest extent, the Corporation agreed with Messrs. Mather and Platt to continue the boring to a depth of 1300 feet from the surface, and on the 12th of December, 1878, the work was completed to this depth. With the object of placing the water-tight apparatus well below the bottom of the old bore-hole, which is 629 feet from the surface, the Water Committee decided to allow the water-tight joint to be placed anywhere between 806 feet and 1000 feet, thus including one of the "great impervious divisions" referred to in Messrs. Mather and Platt's letter of the 30th of July, 1878. On the 30th of December, 1878, Messrs. Mather and Platt elected to place the joint at 835 feet from the surface, thus leaving 465 feet of bore-hole exposed for percolation, or 105 feet more than the length which, on the 30th of August, 1878, they stated would yield more water than the pumps could lift. The engines and pumps were accordingly proceeded with. The workmanship is excellent, and does credit to the Contractors, but the Engineer is not yet in a position to report upon the efficiency of the engines.

On the 25th of August, 1879, pumping was commenced. The result was a complete failure to realize the conditions proposed by the promoters. The yield of the new well was only one-fourth the quantity which the pumps were designed to lift, and which the Contractors had promised, and the yield of the old well was at once seriously diminished. For the week ending the 6th of September, when the pumping was continuous, the yield of the new well was 359,234 gallons a day, and the loss in the old well 75,503 gallons a day, leaving a net gain of 283,731 gallons a day. As in all such cases, the yield of the new well slightly increased at first, and for the week ending the 28th of September it had risen to 402,268 gallons a day, while the yield of the old well had fallen off to the extent of 112,837 gallons a day, thus leaving a net gain of 289,431 gallons instead of the 1,428,000 gallons promised.

The Borough Analyst's report upon the quality of the water is satisfactory, except as regards hardness and proportion of chlorine. The hardness is 17·9°, being much higher than the hardness of any other Liverpool public well when first used. The chlorine is 6·1 parts per 100,000—a proportion in itself not objectionable—but 65 per cent. greater than the quantity in the old well. The absence of nitrogen as nitrates indicates a strong probability that this chlorine is derived from sea water rather than from sewage, and it would therefore appear that the fear expressed in the Engineer's letter of March 2, 1878, is being verified even sooner than was anticipated. At the present low rate of yield, however, the increase of chlorine is likely to be very slow.

The total maximum yield of the new and the old well is now 1,761,945 gallons a day, and this quantity can be pumped by the old engine.

The cost of working the new engines and pumps at the present time exceeds the rate of £1200 a year, exclusive of repairs, and as it is now clearly proved that the lower waters cannot be cut off from the upper waters, the utility of maintaining them in operation, after a sufficiently long trial has been made, is not apparent. At a trifling cost a tunnel 7 feet long might be driven from the old well to the new bore-hole, and the full benefit of the new works could thus be obtained without the cost, to say nothing of the ultimate risk attending the working of the new pumps.

In reply to a question,

The ENGINEER said he did not exactly know what was the total cost of the experiment, but it was from £18,000 to £20,000.

The CHAIRMAN explained that the Committee had incurred an expenditure in addition of £10,000 in laying a main to convey soft water to the people below Bootle.

Alderman BENNETT said that so long as the bore-hole was yielding more and more, it was premature to come to a definite conclusion, and Mr. Mather was of opinion that some time must elapse before they could estimate the proper yield.

The ENGINEER said that although the new bore-hole had increased in supply, the old well diminished nearly to the same extent.

It was then resolved that the report should be printed, and a copy sent to each member of the Council.

THE LANCASHIRE COAL AND IRON TRADES.

(FROM OUR OWN CORRESPONDENT.)

The demand for the better classes of round coal suitable for house-fire purposes continues to improve slightly, and there is a tendency to more firmness in prices; but, beyond a partial advance which has been made by one firm in the Manchester district, rates are not generally quotably higher. Best Wigan Arley can still be bought at the pit mouth at about 8s. to 8s. 6d. per ton; common sorts, 6s. to 7s.; and Pemberton four-feet, 6s. to 6s. 6d. per ton. Anything doing in gas coal is almost entirely confined to deliveries on account of contracts already placed, there being very few fresh inquiries in the market. The inferior classes of fuel, all through, continue very bad to sell, there being very little improvement in the demand for iron-making, whilst for mill use the requirements, if anything, are less. Common classes of round coal are a drug, and it is difficult to quote any fixed price, owing to the extremely low selling which is still going on in the market. In some cases, for large orders for shipment, very little more than 4s. per ton is being taken for common coal at the pit mouth, and there are plenty of sellers at from 4s. 6d. to 5s. 3d. per ton, according to quality; burgy is quoted at from 3s. 9d. to 4s. 3d. per ton, and good slack can be bought at from 2s. 9d. to 3s., whilst some of the common sorts can be bought at under 2s. per ton at the pit mouth.

In the iron trade of this district there has been a good deal of excitement during the past week, owing to the continued upward movement in prices, and there now seems to be little doubt that the American demand which has been the chief cause of the spurt in the market will be maintained at least well into next year. There are large inquiries in the market for forward delivery, and both for raw and finished iron prices have gone up considerably during the past week. In pig iron the advance has been chiefly in outside brands, which are at least 5s. per ton higher than last week, local makers only asking an advance of about 6d. per ton, and for delivery into the Manchester district Lancashire pig iron is now quoted at about 47s. 6d. per ton for No. 3 foundry, and 47s. for No. 4 forge, less 2½ per cent. For finished iron, makers scarcely know what to ask in the present condition of the pig iron trade; but quotations show an advance of about 10s. per ton upon late rates, and for delivery into the Manchester district good Lancashire bars are quoted at from £5 5s. to £5 10s. per ton. Forge proprietors generally report that they are better supplied with orders; but there are not many of them that can yet be said to be really busy.

THE COAL AND GENERAL TRADES OF THE NORTH OF ENGLAND.

(FROM OUR OWN CORRESPONDENT.)

The Durham gas coal trade is actively employed. The only drawback upon it has been a scarcity of ready tonnage needful for coasting purposes. But the collieries did better in respect to tonnage last week than the week before. There was a further supply to hand. More choice was open to merchants and gas companies. The first-class gas collieries were kept well supplied with orders. Recent contracts made for short periods have been done at a trifling advance per ton in several instances upon previous rates. Best gas coals show a slightly improving tendency, but the range of prices is small. The quotations at the best collieries are pretty uniform. Most sorts of the Durham coals are likely to be materially affected by the state of the iron market. It is most difficult to determine how much of the recent sudden advance in the price of iron is owing to a *bonâ fide* demand for shipments to America and abroad, or is only the result of speculation. If there should be a substantial improvement established in the Cleveland iron trade, arising through a steady demand from abroad, especially from the United States, there can be no question of its importance in its relation to the Durham coal trade, for more furnaces would get into blast, and coals which now compete with the second-class gas collieries in what may be called the external trade, would flow into local channels. The latter would thus have a better command of the market than they have now. But during the last week a considerable number of shrewd persons have shaken their heads over the sudden rise in the price of iron, and indeed, of most of the other metals. They confound the iron which is being shipped with that which is going into stock at Glasgow. There is, no doubt, a good deal of speculation in the market; too much to last long. It is predicted that if such a state of things continue there must be a reaction and a collapse of prices. At the same time, all the best authorities state that a very substantial business has been done, and is doing in iron with the United States. Steam and house coals were unchanged in price last week. Manufacturing and inferior coals realize a little more money for local consumption. There were good sales of coke last week for forward delivery.

Tonnage was rather scarce at the coal ports last week. Handy steamers and little sailing vessels of from eight to ten keels held an improved position in the freight market. There was an advance in the rates for traders, when coals were in request for immediate shipment, of 6d. per ton. Few, if any, sailing vessels were chartered to load coals from the Tyne for London last week. They have gone completely out of date. The trade

for all practical purpose is done entirely by steamers. The new steamer reported lately as having been built by Messrs. Palmer and Co., of Jarrow, the third vessel to be employed in carrying gas coals from the Tyne Dock to the wharves above London Bridge, made her trial run from the Tyne with very satisfactory results last week. The boats are all built after one model.

The general manufacturing trades of the Tyne are doing very well. The shipments of fire-bricks, fire-clay goods, and cement are considerable.

TRADE NOTES FROM SCOTLAND.

(FROM OUR OWN CORRESPONDENT.)

On Monday, the 29th ult., an interview was held between a deputation of the Police Commissioners of Johnstone and Mr. James Reid, Town Clerk, on the one hand, and Messrs. M'Innes, M'Kenzie, and Lochhead, Agents for the Gas Company, on the other, when a cheque for £22,402 was handed to the latter in payment of the sum of £19,926 12s. 6d., being the amount of the award and part expenses of the arbitration connected with the purchase of the works under the provisions of the Burghs Gas Supply (Scotland) Act, together with upwards of £1300 which had accumulated in the name of interest since the date of the decreet-arbitral. The business of the 29th liquidates all claims of the Gas Company; and in future the gas supply undertaking of the town will be managed by the Police Commissioners. At present the price of gas in Johnstone is 5s. 5d. per 1000 cubic feet, and the pipeage connected with the works extends to Elderslie, Quarrelton, and Merchiston. As mentioned in a recent issue of the JOURNAL, a loan of £22,000 was negotiated for the purpose of "paying the piper." The terms of the loan provide for its complete repayment in 40 years.

Not only the "cheapest gas in Scotland"—to use what is now a somewhat familiar expression—but the "cheapest gas in Great Britain," was the subject on which some remarks were made in the Dundee Gas Commission on Wednesday last by Mr. Alexander Maxwell, who presided on the occasion. In making a sort of valedictory speech, he said he was gratified to think that the business of the Commission had been managed in a way that satisfied the community, and that their gas was the cheapest in Scotland. So far as his knowledge extended, it was as cheap as any produced in England, and he believed, taking into account its illuminating power, it was cheaper than the gas in any town he knew in Great Britain. Fearing that his remarks might lead to misconception, Mr. Maxwell has since written to the leading local paper to give an explanation of them. He proceeds as follows:—"In saying that, as far as my knowledge extended, our gas was as cheap as any produced in England, I did not mean absolutely per 1000 measured feet—for in a number of places gas is sold at lower rates—but, as I put it in the next sentence, taking into account its illuminating power. Judging by this standard, I do not know of any town that has cheaper light."

The experiments with the electric light are still proceeding at the St. Enoch's Station of the Glasgow and South-Western Railway. It must be confessed that, in consequence of the disuse of reflectors, and by placing the lamps differently, the several platforms of the spacious area have of late been lighted more satisfactorily than they were at first. I understand that two other electric lamps are yet to be brought into requisition, and that after the British Electric Light Company's agent has gained as great a success as is considered possible, the Sugg system of lighting by gas is to be experimented with, so that the two systems may be put against each other.

It was lately proposed by the people of Buckhaven (Fifeshire) that the Directors of the East Wemyss and Buckhaven Gas Company should supply gas for the street lighting, and raise the price of gas to the consumers in Buckhaven to the amount that would cover that of the street-lamps. The Directors refused to accede to the request, and the result is that a proposal has been made to get up a gas company for Buckhaven, and cut off the connection with Wemyss. Within the last week or so the proposal has been heartily responded to, a considerable number of shares having been taken up.

In opening the winter course of lectures in Anderson's College, Glasgow, on Friday evening, Professor Dittmar, F.R.S.E., a member of the British Association Gas Committee, took as his subject the methods for the production of light and heat, scientifically considered. Some of the lighting experiments were alike very effective and interesting.

A new water supply scheme for the district of Crookedholm and Hurlford, near Kilmarnock, was publicly inaugurated last Monday. The reservoir is situated on the lands of the Duke of Portland, its capacity being 3½ million gallons of water, which is equal to a supply of nearly 50 days to the district. The estimated assessment is 8½d. per £1 of rental on tenants, and the same on property, subject to the usual deduction of 25 per cent.

The town of Lochgilphead, in the West Highlands, has also just had a water supply scheme completed.

Dr. Henry D. Littlejohn, Edinburgh, has been appointed by the Board of Supervision to inquire and report on the question of the water supply of Carnoustie, a manufacturing village of some importance near Dundee.

The Glasgow pig iron warrant market continues to be violently excited, and prices advance by "leaps and bounds" daily. Everything offered is eagerly bought up, prices appearing to be no object. Business was transacted up to 64s. cash on Friday, the advance being fully 50 per cent. within little over two months.

A good deal of excitement is also showing itself in the coal trade. In sympathy with the advanced price of pig iron, miners wages are going up, and, as a matter of course, the price of coal is also advancing.

DUKINFIELD, DENTON, AND HAUGHTON GAS-WORKS.—Mr. Harrison Veevers, Assoc. M. Inst. C.E., late of Bolton, has been appointed Engineer and Manager of these works, in place of Mr. Bridge.

THE LATE MR. LAMING.—Messrs. Forbes and Abbott, Chemical Works, Old Ford, have sent a cheque for ten guineas (£10 10s.) as a contribution to our fund for the benefit of the widow of the late Mr. Laming.

DEATH OF MR. A. F. LIVESAY, OF VENTNOR.—The death is announced of Mr. Augustus Frederick Livesay, which took place on the 25th ult., at the advanced age of 71. Deceased was the founder of the Ventnor Gas and Water Works some 30 years ago, and was a Fellow of the Royal Institute of British Architects.

THE WATER SUPPLY OF WAKEFIELD.—On Tuesday last the Water-Works Committee of the Wakefield Corporation, accompanied by their Engineer (Mr. E. Filliter), the Town Clerk (Mr. H. Morgan), and the Secretary (Mr. J. Sykes), visited the sites of the intended storeage reservoir at West Ardsley, and the service reservoir and filter-beds at Lindle Hill. Mr. Filliter pointed out the site of the intended new storeage reservoir, and the mode of its construction, and stated that when finished it would be capable of containing 300 million gallons of water. The Committee considered all the sites to be well adapted for the purposes required, and thought it would be of the greatest advantage to have so large a storeage of water within such a short distance of the town. After the visit to Ardsley, the Committee proceeded to view the works at Stanley Ferry and Field Head, which were found in a satisfactory condition.

Register of Patents.

1092.—MORGAN-BROWN, W., Southampton Buildings, London, "*Improvements in fluid-meters.*" A communication. Patent dated March 19, 1878.

These improvements relate to meters which measure liquids positively—that is to say, by filling and emptying alternately a recipient of any known capacity, such successive charges and discharges being registered on dials.

For the purpose of the invention a receptacle or cylinder is used in which a piston or solid membrane is caused to oscillate backwards and forwards by the pressure of the liquid. This oscillating membrane may, however, be replaced by a piston working with a to-and-fro motion in a cylinder placed horizontally or vertically.

One of the principal improvements of the invention consists in the peculiar mechanism adopted for reversing or feeding the water alternately on each side of the oscillating piston or membrane, which is particularly adapted to fluids on account of their non-elasticity.

Another principal improvement consists in the mechanism employed for transmitting the motions of the piston to registering clockwork and dials situated externally with reference to the meter, which mechanism is not in any way influenced by the pressure inside the meter.

1096.—LAKE, W. R., Southampton Buildings, London, "*Improved apparatus to be connected with the stopcocks of gas-pipes for opening and closing the same.*" A communication. Patent dated March 19, 1878.

This invention is to provide means whereby the stopcocks of gas-pipes or burners may be operated to turn the gas on or off, or regulate the supply; and consists in the combination of an oscillating or spring platform with one or more connecting-rods and rock-arms or bell-cranks. The platform may be arranged on or near the level of the floor, so that it can be operated by a person stepping thereupon; or it may be placed in an elevated position, and made to serve as a seat. It is supported either by means of a central or corner pivots, or by springs. If the apparatus is to be operated by the feet, the platform should be placed just within the main entrance of the building or apartment; but it may be operated equally well if placed in any other desired locality. The motion is communicated by means of a strap or link which connects one end of a bell crank with the platform frame. The crank operates on a pivot, and transmits the motion to the key or handle of the stopcock.

Intermediate bell cranks, if necessary, may be arranged, through which to transmit the motion. These should be provided with perforations, in order that the connecting-rods may be adjusted to either partially or entirely open or close the gas supply. If the apparatus be used in connection with self-lighting burners, the gas will become ignited the moment the platform is depressed, in this manner serving as a burglar alarm or indicator.

The keys of independent burners may be operated as follows:—A device is used, provided for a certain distance from one end with a slit, one portion of which is enlarged. Across another portion of it is constructed a stirrup or bridge for supporting the device on the flattened portion of a key whenever it is desired that the same shall be connected with the operating mechanism. As this device is designed to be employed for operating the keys, so as to increase or diminish the brilliancy of the light after the gas has been turned on and ignited, a certain portion of the slit is enlarged and rounded, to allow of its being raised, and the key operated by hand whenever a total extinguishment of the gas is desired. The device on being released will rest on the upper edge of the flattened portion of the key, and while conforming to all the movements of the mechanism will cease to operate the same.

1105.—LAKE, W. R., Southampton Buildings, London, "*Improvements in water-meters.*" A communication. Patent dated March 20, 1878.

This invention relates to water-meters in which a reciprocating piston resting in a circular cylindrical case moves alternately forward and back by the pressure of the water behind it, and at the end of each stroke shifts the valves from one position to the other, to change the induction and eduction currents of water.

1109.—COUGNET, J., and POTEL, A. P., Brussels, "*New or improved apparatus for injecting, exhausting, and forcing fluids, which apparatus is also applicable for other purposes.*" Provisional protection only obtained. Dated March 20, 1878.

This apparatus consists of a pipe or tube, the hole or opening through which is of square or rectangular section at each end, and the sides taper or narrow inwards from or near the ends, so that at a part of the length the hole in section forms a parallelogram, the length and breadth of which are smaller than the corresponding sides of the square or rectangle. Thus longitudinal sections of the pipe taken at right angles to each other would show the hole to be somewhat similar in form to two inverted V's joined together at or near their smaller ends, or two V-shaped chambers opening into each other at their smaller ends. To one end of the pipe is affixed a funnel or tubular mouthpiece of rectangular section, which projects into it by a tapering nose. The inner part of the funnel is divided into two branches by a central guide-plate, so disposed and shaped that the fluid entering under pressure will be divided into two currents, which, after leaving the nose, will unite in that part of the pipe which is of smaller section. In section the funnel resembles somewhat the letter W. In the side of the upper chamber of the pipe is an aperture fitted with a suitable pipe for the inlet of the fluid or substance to be operated on; and in the side of the lower chamber is a hole or aperture provided with a suitable cock or tap through which the apparatus may be emptied.

APPLICATIONS FOR LETTERS PATENT.

3904.—WOOLLEY, W. B., Birmingham, "Improvements in hydrocarbon stoves and lamps for lighting and heating." Sept. 29, 1879.

3905.—ALEXANDER, E. P., Southampton Buildings, London, "Improvements in gas-motors." A communication. Sept. 29, 1879.

3920.—HADDAN, H. J., Westminster, "Improvements in gas-regulators." A communication. Sept. 30, 1879.

3939.—KESSELER, C., Berlin, "Improvements in meters for water and other fluids." A communication. Sept. 30, 1879.

3941.—FERGUSON, J., jun., Edinburgh, "Improvements in lenses for magnifying or increasing and distributing artificial light." Oct. 1, 1879.

3947.—ATKINS, T., Clapham Common Gardens, London, "Improvements in apparatus for evolving or generating, storing, and distributing hydrogen and hydrocarbon gases from carbonaceous fluids and substances, and in the application of the said gases and fluids to various useful purposes." Oct. 1, 1879.

3948.—KROOG, J., Halle-on-the-Saale, Prussia, "An improved filtering apparatus." (Complete specification.) Oct. 1, 1879.

3950.—SMITH, G., Glasgow, "Improvements in the construction of baths, tanks or cisterns, and analogous domestic and sanitary apparatus, including stable fittings." Oct. 2, 1879.

3953.—TOWER, B., Blackheath, London, "Improvements in rotary engines and pumps." Oct. 2, 1879.

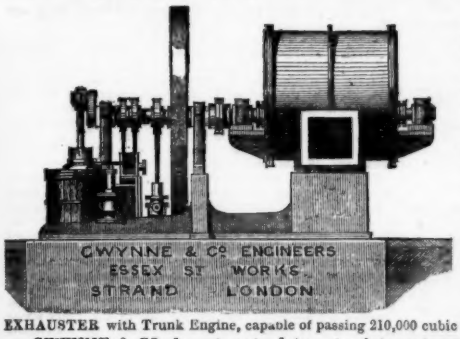
Share List of Gas and Water Companies.

(Corrected by Mr. ARTHUR G. PRATER, 23, Cornhill, from the latest Stock Exchange Quotations.)

Number of Shares issued.	Amount per Share.	Name.	Amount paid up per Share.	Last Divd. p.Cent. p. Ann.	Latest Quotations.
	£	GAS COMPANIES.	£ s. d	£ s. d	£
589892	10	Alliance and Dublin	10 0 0	10 0 0	16¼—¾
10000	20	Anglo-Romano . .	20 0 0	10 0 0	22—24
5000	20	Bahia (Limited). .	20 0 0	4 0 0	13—14
1500	20	Do., 2nd pref. . .	20 0 0	7 10 0	20—22
40000	5	Bombay (Limited).	5 0 0	7 10 0	5¾—6¼
10000	5	Do., fourth issue.	4 0 0	7 0 0	½—1 pm.
10000	10	Bournemouth . . .	10 0 0	8 0 0	13½—14½
229700	..	Brentford	100 0 0	9 0 0	148—53
..	..	Do., 5 per ct. pref.	100 0 0	5 0 0	95—100
..	20	Do., C shares . .	18 0 0	9 0 0	6—8 pm.
5400	20	Brighton	20 0 0	10 0 0	33—5
5000	20	Brighton and Hove	20 0 0	10 0 0	33—5
14000	20	British (Limited) .	20 0 0	10 0 0	33—5
7223	20	Cagliari (Limited).	20 0 0	7 0 0	16—18
1500	10	Colney Hatch . . .	10 0 0	5 0 0	8—9
3500001.	Sk.	Commercial	100 0 0	11 0 0	188—92
700001.	Sk.	Do., 7 per cent. .	100 0 0	8 0 0	135—40
20000	20	Continental Union.	20 0 0	6 10 0	18—19
22000	20	Do., new	14 0 0	6 10 0	2⅛—2 dis
10000	20	Do., preference .	20 0 0	7 0 0	22¼—3¼
750001.	Sk.	Crystal Palace Dist.	100 0 0	10 0 0	175-6xd.
1250001.	Sk.	Do., 7 per cent. .	100 0 0	7 0 0	125—30
500001.	Sk.	Do., preference .	100 0 0	6 0 0	118—22
25000	6	Do., ord. 7 p. c. .	1 4 0	7 0 0	¼—⅜
7180	25	Edinburgh	25 0 0	10 0 0	46—48
23406	10	European (Limited)	10 0 0	10 10 0	17½—18½
12000	10	Do., new shares.	7 10 0	10 10 0	5—¼ pm.
35406	10	Do., new shares .	5 0 0	10 10 0	0—¼pm.
4096300l.	Sk.	Gaslight & Coke A.	100 0 0	10 10 0	179—81
1000001.	Sk.	Do. B.	100 0 0	4 0 0	77—79
30000	10	Do. 5 per ct. pref. conv., 4th issue.	10 0 0	5 0 0	17½—¾
50000	10	Do. do., 5th do. .	10 0 0	5 0 0	16¼—½
2000001.	Sk.	Do. C 10 p.c. pref.	100 0 0	10 0 0	207—10
3600001.	,,	Do. D do. do. .	100 0 0	10 0 0	207—10
1650001.	,,	Do. E do. do. .	100 0 0	10 0 0	207—10
350001.	,,	Do. F 5 do. do. .	100 0 0	5 0 0	102—5
600001.	,,	Do. G 7½ do. do. .	100 0 0	7 10 0	150—155
1300000l	,,	Do. H	100 0 0	7 0 0	132—4
6200	5	Georgetown, Guiana	5 0 0	7 0 0	4¼—4½
115000	100	Glasgow Corporation Gas	100 0 0	9 0 0	205—210
	100	Do., do.	100 0 0	6 15 0	155—160
..	100	Grimsby Gas, A. .	100 0 0	..	186—190
..	10	Hampton Court . .	10 0 0	10 0 0	14—15
7600	10	Hong Kong (Lim.)	10 0 0	10 0 0	15—16
5000	10	Hornsey	10 0 0	10 0 0	14—15
2000000l	100	Imperl. Continental	100 0 0	10p.c.& 2 p.c.	177—9 bonus
..	..	Kingston	..	..	..
..	..	Lea Bridge	..	..	11½—12½
9000	4	Limerick Gas . . .	4 0 0	3 15 0	2—2½
56100l.	100	Liverpool United .	100 0 0	..	180—185
1691001.	100	Do., B	100 0 0	7 0 0	125—135
3865001.	Sk.	London	100 0 0	10 0 0	175—8
1500001.	Sk.	Do., 1st pref. . .	100 0 0	6 0 0	123—126
7622	25	Do., A shares . .	25 0 0	6 0 0	29—31
266921.	Sk.	Do., Debent. stk.	100 0 0	5l. & 6l.	..
15000	5	Malta and Mediterranean (Limited).	5 0 0	2 10 0	1⅞—2
6000	5	Do., preference .	5 0 0	7 10 0	4½—5
20000	5	Mauritius (Limited)	2 5 0	3 6 8	1⅞—1¼ dis
25000	20	Monte Video (Lim.)	20 0 0	8 0 0	13½—14½
8000	10	Nictheroy, Brazil (Limited)	10 0 0	5 0 0	3½—4½
30000	5	Oriental (Calcutta).	5 0 0	9 0 0	6¼—7
30000	5	Do., new shares .	3 10 0	9 0 0	¾—1¼pm
10000	5	Ottoman (Limited).	5 0 0	3 0 0	2—2½
10000	10	Pará (Limited) . .	10 0 0	3 0 0	4½—5
27000	20	Phœnix	20 0 0	10 0 0	37—8
3600001.	100	Do., new max. 7½	80 0 0	7 10 0	109—12
1440001.	Sk.	Do., capitalized .	100 0 0	5 0 0	98—100
	20	Do., new, 1876. .	16 0 0	10 0 0	16—17pm
..	..	Richmond (Surrey)	..	..	15—16
37500	20	Rio de Janeiro (L.)	20 0 0	10 0 0	26—27
1500	32½	Shanghai	32 10 0	12 0 0	..
..	100	Sheffield, A	100 0 0	10 0 0	194—195
	100	Do., C	100 0 0	10 0 0	185—187
12500	5	Singapore (Lim.) .	5 0 0	7 10 0	5½—6
2000	5	Do., preference.	5 0 0	7 10 0	5½—6
500000	Sk.	South Metropoltn.	100 0 0	11 10 0	197—200
15000	10	Surrey Consumers	10 0 0	10 0 0	18½—19
10000	10	Do., new. . . .	10 0 0	10 0 0	18½—19
..	5	Tottenham & Edmonton	5 0 0	10 0 0	8⅛—8⅜
1500	10	Wandsw. & Putney	10 0 0	10 0 0	14½—15
1500	10	Do.	10 0 0	7 10 0	10⅛—11⅛
4000	10	Do.	10 0 0	7 0 0	..
26000	5	West Ham	5 0 0	10 0 0	8—9
..	..	West Kent	..	..	13—14
2400	5	Woolwich, Plmstd. and Charlton . .	5 0 0	16 0 0	9—10
		WATER COMPANIES.			
615600	100	Chelsea	100 0 0	6 0 0	153—156
1624700	100	East London . . .	100 0 0	6 0 0	162—165
10798	50	Grand Junction . .	50 0 0	5 0 0	87—89
5840	25	Do., ¼ shares . .	25 0 0	5 0 0	43¼—44¼
6160	25	Do., new ditto; max. div., 7½ p.c.	25 0 0	5 0 0	38—40
5551801.	100	Kent	100 0 0	8 0 0	213—18
7818001.	100	Lambeth	100 0 0	6 5 0	158—62
3261501.	100	Do., max., 7½ p.c.	100 0 0	6 5 0	153—156
442	100	New River	100 0 0	7 0 0	320—350
4475	100	Do.	85 0 0	7 0 0	280—300
400000	100	Do., deb. sk., 4p.c.	100 0 0	4 0 0	101—103
6668001.	100	Southwrk & Vauxh.	100 0 0	5 0 0	131—134
3247001.	100	Do., pref. stock.	100 0 0	5 0 0	119—121
1265001.	100	Do., D shares. .	100 0 0	4 0 0	129—132
700001.	100	Do., new ordnry.	..	4 10 0	..
1600	100	Do., nw. ord. No. 1	40 0 0	4 10 0	..
15073	61	West Middlesex .	61 0 0	6l. p.sh.	145—147

The GRAND MEDAL of MERIT at the VIENNA EXHIBITION, TWO MEDALS at the PHILADELPHIA EXHIBITION and TWO MEDALS at the PARIS EXHIBITION, have been AWARDED to GWYNNE & CO. for GAS-EXHAUSTERS, ENGINES, and PUMPS; Also 27 OTHER MEDALS AWARDED at all the GREAT INTERNATIONAL EXHIBITIONS.

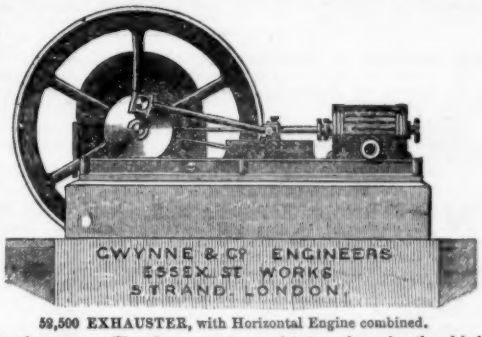
GWYNNE & BEALE'S PATENT GAS-EXHAUSTERS & ENGINES.



EXHAUSTER with Trunk Engine, capable of passing 210,000 cubic feet per hour.

The Judges report on the combined Exhauster and Steam-Engine exhibited at the Philadelphia Exhibition is—"*Reliable compact Machine, well adapted for the purpose intended, of excellent workmanship.*"

GWYNNE & CO. have made the largest and most perfect Gas-Exhausting Machinery in the world, and have completed Exhausters to the extent of 8,000,000 cubic feet passed per hour, of all sizes from 2000 to 210,000 cubic feet per hour.



52,500 EXHAUSTER, with Horizontal Engine combined.

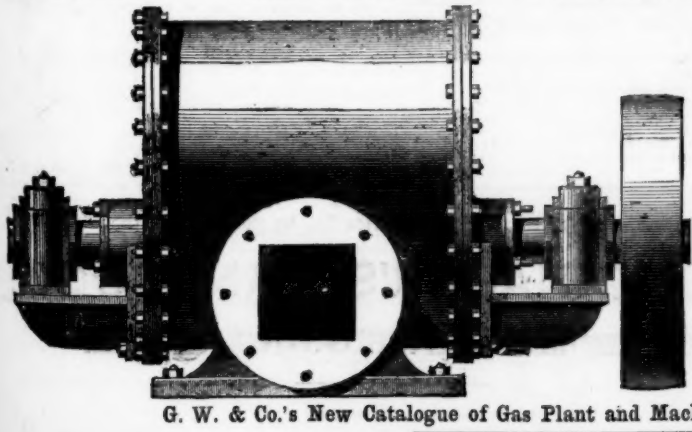
GWYNNE & CO. do not pretend to enter into a struggle with other makers in respect to cheapness. They have never sought to make price the chief consideration, *but to produce machinery of the very highest quality, and most approved design and workmanship.* The result is that in every instance their work is giving the fullest satisfaction. Numerous testimonials and references can be given to Companies using their Machinery for years past.

Exhausters, with or without Engines combined, can be made to pass the gas WITHOUT OSCILLATION OR VARIATION IN PRESSURE Regulators, Bye-Passes, Stop-Valves, Gas-Valves, Station Governors, and Gas Machinery of all Sizes.

PLEASE ADDRESS IN FULL, GWYNNE & CO., Hydraulic and Gas Engineers, ESSEX STREET WORKS, VICTORIA EMBANKMENT, LONDON, W.C., ENGLAND.

Gwynne & Co.'s New Catalogue on Gas-Exhausting and other Machinery may be obtained on application at the above Address.

BEALE'S IMPROVED PATENT GAS EXHAUSTERS,



WITH OR WITHOUT

WROUGHT-IRON SPINDLES AND

ENGINES COMBINED.

GEORGE WALLER & CO.,

MAKERS OF

ENGINES, EXHAUSTERS,
INDEX AND DISC GAS-VALVES,
HYDRAULIC MAIN VALVES,
BYE-PASS VALVES,
TAR, LIQUOR, AND OTHER PUMPS,
SCRUBBERS AND PURIFIERS,
CONDENSERS, BOILERS, &c.

G. W. & Co.'s New Catalogue of Gas Plant and Machinery can be had on application.

PHŒNIX ENGINEERING WORKS:

HOLLAND STREET, SOUTHWARK, S.E.

WANTED, Readers of the NEW Edition, 1879, "Cooking & Heating by Gas;" on Burners, &c. Copies, by post, Threepence, direct from the Author, MAGNUS OHREN, Assoc.M.I.C.E., Gas-Works, SYDENHAM.

WANTED, a Steady Man, as Stoker in the Gorleston and Southtown Gas-Works.
Apply to W. PALGRAVE BROWN, Secretary, Southtown, GREAT YARMOUTH.

WANTED to Purchase, by a Suburban Gas Company, an old Cast-Iron GASHOLDER-TANK, that would hold about 200,000 gallons of Tar.
Particulars to be sent addressed to No. 592, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

WANTED, a Situation by a Man who thoroughly understands the Testing, Making, and Repairing of Wet and Dry Meters, Lamps, &c., or as Inspector or Manager of small Works. 12 years experience in Gas-Works. Good testimonials.
Address J. H., 8, Princes Road, Ealing, LONDON.

WANTED, by a Young Man, aged 23, a Situation in a Gas-Works. Five years experience in a works making 80 millions. Can use Photometer, is fair Draughtsman, good writer, quick at figures, and thoroughly understands general routine. No objection to go abroad.
Address No. 593, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

WANTED, by a Provincial Gas Com-pany in the South of England, a first-class Retort FOREMAN. Alternate day and night duty. Wages £2 2s. per week. None need apply but competent, experienced, steady, and reliable men.
Address No. 594, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

WANTED, by the Advertiser, a Situa-tion as MANAGER or ASSISTANT MANAGER of a large Works. Has had every experience in a Gas-Works. Satisfactory reasons for wishing to change. Good references and testimonials.
Address No. 589, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

WANTED, by the Peel Gaslight Com-pany, a Competent WORKING MANAGER, perfectly conversant with Laying of Mains, Connecting Service-Pipes, Manufacture and Distribution of Gas, and whatever may be incidental to the working of Gas-Works.
Applications (containing copies of testimonials) to be addressed, on or before the 13th inst., to Mr. R. E. WIGHT, Secretary, Peel, ISLE OF MAN.

WANTED, a Working Manager of a small Gas-Works, who has a practical knowledge of the Making and Distribution of Gas, Retort-Setting, Mains and Service Laying, Meter Fixing, and Indoor Fittings.
Applications (with copies of recent testimonials) to be addressed to No. 590, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

TO GAS COMPANIES.

WANTED, by an Energetic Man, aged 35, a Situation as MANAGER, or SECRETARY and MANAGER, at home or abroad. Has had nine years practical experience in the whole routine. Salary fixed, or paid according to results. Satisfactory reasons for desiring to change. Excellent testimonials and references.
Address No. 591, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

EAST RETFORD CORPORATION GAS UNDERTAKING.

WANTED, two thoroughly Steady and Reliable WORKING FOREMEN to take charge of the Gas-Works, and machinery connected therewith. Parties applying must be up in Carbonizing. References as to character and ability required.
Particulars of duties may be obtained by applying as under.
FREDK. BAILEY, Manager.

AS Working Manager or Foreman of Gas-Works. Can do anything in the Manufacture or Distribution of Gas, Meter Repairing or Fixing, Smithing, Plumbing, and any Repairs in the Works.
A. HUGHES, 300, Bridge Street West, BIRMINGHAM.

FOR SALE—Three Purifiers, 9 ft. by 6 ft. by 3 ft. deep, all complete, with grids and bearing bars for same.
The above are for Sale in consequence of having been replaced by larger. No reasonable offer will be refused for the whole or for a portion.
Apply to F. BOWER, Manager, North Bierley Gas-Works, LOW MOOR, near BRADFORD.

TO BE SOLD, Cheap, Three Telescopic GASHOLDERS, two 60 ft. diameter and 20 ft. deep each lift, and one 70 ft. in diameter and 20 ft. deep. Only been in use eight years. May now be seen at work at the Effingham Street Gas-Works, Sheffield.
For price, apply to THOMAS PIGGOTT AND CO., Spring Hill, BIRMINGHAM.

GAS PLANT FOR SALE.

A 10-in. Vertical Pipe Condenser, having 20 Pipes, each 19 ft. high, on Cast-Iron Base Box.
A Scrubber, 16 ft. high 5½ ft. diameter, fitted with thin boards, Self-Acting Liquor Distributor, 10-in. inlet and outlet pipes.
Two Single-Flue Cornish Boilers (new in 1870), each 9½ ft. long, 3 ft. 9 in. diameter; Fire Tube of Low Moor Iron, complete with all Fittings.
All in good working order; removed to make room for larger plant.
For further particulars apply to THOS. TREWHITT, Gas-Works, WEST HARTLEPOOL.
May 8, 1879.

THE Richmond (Surrey) Gas Company are prepared to receive TENDERS for their Surplus TAR from Nov. 1, 1879, to March 31, 1881.
Particulars can be obtained on application to Mr. Eldridge, the Manager at the Works.
Tenders to be delivered by noon of Friday next.
The Directors do not bind themselves to accept the highest or any tender.
E. B. BLOTT, Secretary.
Richmond, Surrey, Sept. 27, 1879.

THE Directors of the Farnworth and Kearsley Gas Company are prepared to receive TENDERS for the Surplus TAR produced at their Works for the Twelve months ending Oct. 31, 1880. The quantity estimated to be about 80,000 gallons. The Contractor must give security for the due fulfilment of the contract.
Tenders, sealed and endorsed "Tender for Tar," to be addressed to the Chairman, J. Warburton, Esq., and sent in on or before Wednesday, Oct. 15.
Any further information can be obtained from the Manager, T. L. SHEPPARD.

SCARBOROUGH GAS-WORKS.

THE Directors of the Scarborough Gas Company are prepared to receive TENDERS for the construction and erection of a Telescopic GASHOLDER.
The drawings and a specification may be seen, and forms of tender obtained (on payment of one guinea, which will be returned if a *bona fide* tender be made according to instructions), on application at the Office of the Manager of the Company, in Scarborough, or at the Office of the Engineer, Mr. G. W. Stevenson, 38, Parliament Street, London, S.W., on and after Wednesday, Oct. 8, 1879, and sealed tenders must be sent in to me, the undersigned, endorsed "Tender for Gasholder," on or before Wednesday, Oct. 22, 1879, not later than Twelve o'clock at noon.
The Directors do not bind themselves to accept the lowest or any tender.
By order,
WILLIAM J. MOON, Manager.
Scarborough, Oct. 4, 1879.

WEST BROMWICH GAS-WORKS.

CONTRACTS NOS. 3 & 4.

THE West Bromwich Improvement Commissioners are prepared to receive TENDERS from competent persons for the above-mentioned contracts.
Contract No. 3. The Construction and Erection of Two Telescopic Gasholders.
Contract No. 4. The Construction and Erection of Six Purifiers, each 25 feet square, with Hydraulic Accumulator and Lifting Apparatus, and of a wrought-iron Annular Condenser.
Duplicate copies of the drawings and specifications may be seen, and forms of tender, with quantities, may be obtained (on payment of one guinea for each form of tender, which will be returned in all cases on receipt of a *bona fide* tender on the form supplied) on and after Wednesday, Oct. 8, 1879, on application to the Engineer, Mr. G. W. Stevenson, 38, Parliament Street, Westminster, S.W., or at the Town Hall, West Bromwich, and sealed tenders, properly endorsed, must be delivered on or before Wednesday, October 22 next, at my Offices in the Town Hall, West Bromwich.
The Gas Committee do not bind themselves to accept the lowest or any tender.
CHAS. H. BAYLEY, Clerk.
Town Hall, West Bromwich, Oct. 1, 1879.

THE Gloucester Gas Company, ceasing to manufacture gas at their old works, will have the undermentioned APPARATUS for Sale about the beginning of August, viz.:—
110 Mouthpieces, D-shape, 13 in. by 22 in., with Wrought-Iron Lids, Cross-Bars, Stand, Bridge, and Dip Pipes.
Also about 150 feet of D-shape Wrought-Iron Hydraulic Main, size 19 in. by 19 in. 28 Mouthpieces, D-shape, 16 in. by 20 in., with Wrought-Iron Lids, Cross-Bars, Stand, Bridge, and Dip Pipes. Also about 38 ft. of D-shaped Wrought-Iron Hydraulic Main, size 20 in. by 20 in. Annular Condenser, consisting of six Vertical Pipes, 24 in. diameter, 19 ft. high, with three 12 in. Slide-Valves and 12 in. Connections.
Scrubber (round), 5 ft. by 20 ft., with three 12-in. Slide-Valves, and 12 in. Connections.
Exhauster (Jones) to pass about 15,000 feet per hour.
Exhauster (Beales) to pass about 25,000 feet per hour.
Two Vertical Steam-Engines, each about 6-horse power, with Pulleys, and Shafting used for driving the above.
Boiler 14 ft. 6 in. by 3 ft. 6 in., with Centre Tube, and four Galloway Patent Tubes.
4-horse power Horizontal Steam-Engine.
Three 4-in. Pumps, with cranked Shafting and a pair Mitre Wheels.
Set of four Purifiers, 12 ft. by 12 ft. by 4 ft., with 12-in. Centre-Valve (Cockeys), and Connections and Lift complete.
Station-Meter by A. Wright and Co., London, with three 12-in. Slide-Valves, and 12-in. Bye-Pass and Connections, to pass about 25,000 feet per hour.
Gasholder, Double Lift, with Cast-Iron Tank, capacity 37,000 feet.
Gasholder, Double Lift, capacity 100,000 feet.
Gasholder, Double Lift, capacity 240,000 feet.
Two 12-in. Governors, by Wright, London, with 12-in Valves, Bye-Pass, and Connections.
Two 12-in. four-way faced Valves, by Cockey.
For further information, &c., apply to the undersigned.
R. MORLAND, Engineer.

THE BROMLEY GAS CONSUMERS COMPANY, Incorporated by Act of Parliament in 1865.
Additional Capital: 600 Ordinary Shares of £10 each, arranged in 40 Lots of 10 shares each, and 40 Lots of five shares each.

MESSRS. Baxter, Payne, and Lepper have received instructions from the Directors (under the powers contained in the Bromley Gas Act, 1879) to submit for SALE by Public Auction, at the Cannon Street Hotel, in the City of London, on Tuesday, Oct. 14, at One precisely, 600 ORDINARY SHARES, of £10 each, in the Bromley Gas Consumers Company, as above. The purchaser will be required to pay a deposit of the premium, and 10 per cent. of the nominal value of the shares, and such shares will be registered, and share certificates issued, free of expense, within one month after payment of the balance of the purchase-money, which may be paid at their option in full on Oct. 31, or by instalments of 30 per cent. each on Dec. 31, 1879, March 31, and June 30, 1880; and each purchaser will be entitled to a proportionate part of the dividend accruing from those respective dates, the standard maximum rate of such dividend being limited to £7 per centum p.r annum.
Particulars and conditions of sale may be obtained at the Company's Works, Bromley, Kent; of Messrs. Latter and Willett, Solicitors, Bromley; the place of sale; and of Baxter, Payne, and Lepper, Auctioneers and Land Agents, Town Hall, Bromley, Kent, and 69, King William Street, LONDON, E.C.

EXHAUSTER—Beale's 30,000 feet per hour; Makers, Burton and Waller; fit for immediate use—for sale cheap.
For price and particulars apply to the MANAGER, Brentford Gas-Works, SOUTHALL.

OLDBURY LOCAL BOARD GAS-WORKS.

THE Oldbury Local Board are prepared to receive TENDERS for the Erection of a New GAS-WORKS, to supply their district with gas.
The drawings and specification may be seen on application to the Engineer, Mr. A. Upward, 8, Queen Anne's Gate, Westminster, on and after Wednesday, Sept. 10, 1879, and sealed tenders are to be delivered to me, the undersigned, on or before Monday, Nov. 3, 1879, addressed to the Chairman and Members of the Oldbury Local Board.
Forms of tender may be obtained at the Office of the Engineer on payment of one guinea, which will be returned on the receipt of a *bonâ fide* tender on the form supplied.
The Board do not bind themselves to accept the lowest or any tender.
A. WRIGHT, Solicitor, Clerk to the Board.
Board Room, Oldbury, Sept. 23, 1879.

PADDINGTON LIGHTING DEPARTMENT.

TO METER MAKERS, &c.

THE Vestry of the Parish of Paddington are prepared to receive TENDERS for the following Works, viz.:—The Annual Examination and Keeping in Thorough Repair of all the Meters and Cast-Iron Meter-Boxes attached to the Metered Lamps (about 90 in number), also the Examination, Testing, Repairing, and Adjusting from time to time of all Cocks, Governors, and Burners attached to the Public Lamps (1790 or thereabouts).
Further particulars and printed forms of tender may be obtained at the Works Department, North Wharf Road, Paddington, between the hours of 10 a.m. and 4 p.m.; Saturdays, 10 a.m. and 1 p.m.
The Vestry do not bind themselves to accept the lowest or any tender, and no tender will be received unless made out on one of the printed forms, and the same must be sent in not later than Three o'clock p.m. on Monday, Oct. 20, 1879, and addressed to the Vestry of Paddington, endorsed "Tender for Maintenance of Meters, Boxes, Governors, &c." at the same time a £10 Bank of England note (not to be enclosed with the tender) must be lodged with the Vestry Clerk as evidence that the tender is made *bona fide*, the same to be returned immediately to the parties whose tenders are rejected; but, in the case of the party whose tender is accepted, to be retained until the contract is signed. If the tender be withdrawn after its acceptance by the Vestry, the deposit will become forfeited.
By order,
FRANK DETHRIDGE, Vestry Clerk.
Vestry Hall, Harrow Road, W., Oct. 2, 1879.

Price 28s., handsomely bound in Morocco, cloth sides, gilt edged and lettered.

THE FIRST VOLUME
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On the Science and Practice of the Manufacture and Distribution of
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CONSULTING GAS ENGINEER,

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Reports and Valuations in the Management, Construction, and Structural Value of Gas-Works.

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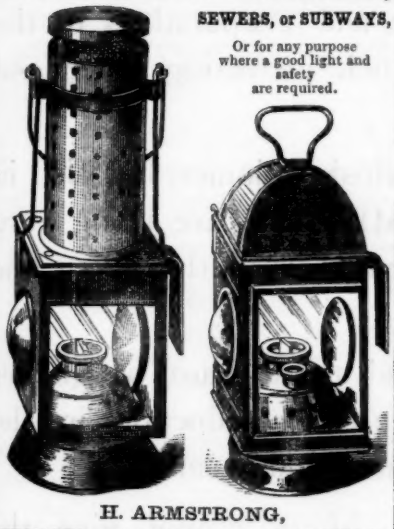
SAFETY-LAMP FOR GAS-WORKS,

SEWERS, or SUBWAYS,

Or for any purpose where a good light and safety are required.



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LONDON.

SWANWICK CANNEL.

Illuminating power, 24 candles. Good Coke, 11½ cwt. to the ton.

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Manufacturers of THE ORIGINAL SILICA OR DINAS FIRE-BRICKS. Specially adapted for Gas-Retort Furnaces and for Siemens's Gas-Furnaces. Shipments promptly executed to London, Liverpool, Hull, Grimsby, &c.

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GAS AND WATER ENGINEERS,

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Supply and Erect Street Lamp Columns, together with Head Irons and Lanterns, as well as all the other fittings connected therewith.

S. P. & Co. also contract with Gas, Railway, and other Companies, Local Boards, and Vestries, for the maintenance and repair of Lamps and Fittings.

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FOR

GAS AND WATER-WORKS,

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REFERENCES TO UPWARDS OF 400 WORKS.

WANTED, by Samuel Thompson & Co., Colliery Office, Lancaster, APPLICATION for PRICES from Gas Managers who are prepared to receive Tenders for GAS COAL or CANNEL.

John Leigh, Esq., M.R.C.S., F.C.S., &c., &c., in his analytical report of S. T. & Co.'s Coal, says: "It is remarkable for its purity, I have scarcely ever examined a Coal containing so small a quantity of ash, and when Cannel of the best description is scarce, it may well replace this material."

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FIRE CLAY & BRICK WORKS,

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Manufacturers of GAS-RETORTS, GLASS-HOUSE FURNACE & BLAST-FURNACE BRICKS LUMPS, TILES, and every description of FIRE-BRICK.

Proprietors of

BEST GLASS-HOUSE POT and CRUCIBLE CLAYS.

SHIPMENTS PROMPTLY AND CAREFULLY EXECUTED.

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GAS, WATER, & STEAM.

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THE

IMPERIAL METER CO.,

LIMITED,

(Formerly Walter Ford, at Gray's Inn Road),

KING'S ROAD, ST. PANCRAS,

Manufacturers of THE IMPROVED DRY GAS-METER, THE PATENT WET GAS-METER, Special Meters for Public Lighting, STATION-METERS, Governors, &c.

M. DAVIS & CO., 27, Wellclose Square, LONDON, E.,

COMMERCIAL GLASS WORKS.

BEST OPAL SHEET GLASS, IN CASES OF 200 FEET.

150 Y	7d. per foot.	26 Y	11d. per foot.
21 Y	9d. ,,	32 Y	1s. 3d. ,,

Enamelled Sheet Glass, Flint and Opal, 1s. 2d. Coloured Glass and Opal, 1s. 6d. to 2s. 6d. per foot.

GAS GLASSES OF ALL DESCRIPTIONS ON HAND; SPECIAL PRICES FOR QUANTITIES.

Now ready, price 6d. and 1s.

THE

SOFTENING AND PURIFICATION

OF

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ON AN IMPROVED SYSTEM.

PART I. explains the application of the system to large or small supplies for Private Mansions, Schools, Colleges, Asylums, Hospitals, Public Institutions, &c. Price 6d.

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JOHN HALL AND CO., STOURBRIDGE,

Manufacturers of FIRE-BRICKS, LUMPS, TILES,

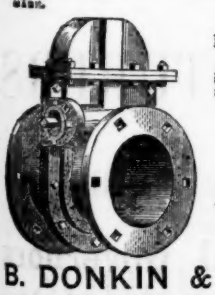
AND EVERY DESCRIPTION OF FIRE-CLAY GOODS.

N.B.—A Stock of 15 and 16 in. CIRCULAR RETORTS always on hand. Other kinds made to order on short Notice.

B. DONKIN & CO.'S

IMPROVED GAS-VALVES

WITH WROUGHT-IRON PINIONS.



These Valves are proved on both sides to 30 lbs. on the square inch before leaving the works, and are kept in stock.

In ordering Valves, please state whether required for under or above ground, and if to be with flanges or spigots and sockets cast on, or with separate spigot and socket pieces.

Also Sole Makers of

J. BEALE'S NEW PATENT GAS EXHAUSTERS,

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STEAM-ENGINES FOR DRIVING GAS EXHAUSTERS,

VALVES FOR AMMONIACAL LIQUOR,

IMPROVED BRIDGE VALVES FOR REGULATING THE SEAL IN HYDRAULIC MAINS,

BYE-PASS VALVES, SCREW WATER-VALVES, &c.

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JOHN ROMANS, C.E., F.G.S.E.,

CONSULTING GAS ENGINEER

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CANNEL COAL FACTOR,

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Plans and Estimates furnished; Gas-Works, Apparatus, Pipes, Machinery, Fire Goods, &c., supplied, or Attested and Shipped for Exportation.

GAS-WORKS TAKEN ON LEASE.

Mr. ROMANS has for upwards of 30 years been practically engaged in the Manufacture of Gas, and has, by extensive experiments, ascertained that by JUDICIOUS INTERMIXTURE of the lighter with the heavier gases, much of the rich Hydrocarbons CAN BE SAVED, which otherwise ARE LOST, during the process of manufacture. He is therefore enabled to give advice to those who favour him with their orders for Cannel, as to the class which will secure for their standard of illuminating power the HIGHEST ADVANTAGEOUS RESULTS.

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ECONOMY IN THE PRODUCTION OF GAS, AND CARBON DEPOSIT ENTIRELY PREVENTED.

PLUTONIC CEMENT,

FOR JOINTING AND REPAIRING RETORTS AND OVENS *in* ACTION AND *out* OF ACTION.

A Pamphlet on the advantages of the above, with Modes of Application, References, Prices, &c., free by post, from the Sole Manufacturer,

WILLIAM RICHARDSON, Gas and Hydraulic Engineer, CHARLES HENRY STREET, and BISSELL STREET, BIRMINGHAM.

THE

WARNER & COWAN METER

The continued confidence of Gas Companies and Corporations in the unrivalled excellence of this Meter, is shown by their increasing orders and greater number as purchasers.

Not only in the United Kingdom and the British Colonies, but also in foreign countries, WARNER AND COWAN METERS are being very largely introduced; and in no case has it appeared that anything but the greatest advantage has been the result of their use.

To the degree they are in any case adopted there must be greater accuracy of registration, tending towards that material reduction in the "leakage account" which their exclusive employment would ensure.

The most "careful watering" of any other Meter cannot give the satisfactory results *necessarily* realized with the Warner and Cowan, even when watered in the most irregular way.

DRY METERS.

In these every improvement which long experience and observation have suggested will be found. The diaphragms, valves, and indexes, together with the internal arrangements and cases, are constructed with a view to the utmost possible durability, and accuracy of registration.

The increasing demand, both at home and abroad, shows that the improvements referred to have been, and continue to be, fully appreciated.

W. & B. COWAN,

(ESTABLISHED 1827,)

WET & DRY GAS-METER MANUFACTURERS,

Original Licensees and Manufacturers of

WARNER AND COWAN'S PATENT SELF-REGULATING METERS;

Sole Licensees and Manufacturers of

Foulis's Patent Station, District, and Differential Governors;

AND OF

THE AUTOMATIC PRESSURE CHANCER,

[WM. COWAN'S PATENT.]

CHURCH ST., MILLBANK ST., *LONDON, S.W.* | DUTTON ST., NEW BRIDGE ST., *MANCHESTER.* | BUCCLEUCH ST. WORKS, *EDINBURGH.*

LAMBERT BROTHERS, WALSALL.

ALPHA TUBE & FITTING WORKS

Manufacturers of W. J. WARNER'S PATENT MARKET GAS STAND-PIPE.

Now ready, GAS CHANDELIER BOOK (Reduced Prices), 7s. 6d.

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LIMITED,

DISTRICT OFFICE: 97, NEW STREET, BIRMINGHAM; AGENT: W. M'GOWAN,

Supply the Best Wigan Arley Mine Gas Coal, Gas Nuts, Gas Cannel, &c.

N.B.—The Wigan Coal and Iron Company, Limited, are exclusive owners of the well-known HAIGH HALL AND KIRKLESS HALL GAS COAL COLLIERIES.

GAS COAL. GAS COAL. GAS COAL.

WELLS, BIRCH, RYDE, and CO., Limited,

HOYLAND SILKSTONE COLLIERIES,

Near BARNSLEY.

This Company is now in a position to raise **2000 tons per day of REAL OLD SILKSTONE GAS COAL.**

"The quality of this Coal for Gas purposes, if equalled, is not excelled by any on record, and the Coke competes successfully with best Durham."—See *Mining Journal*, Aug. 11, 1877.

Prices quoted to any Railway Station, or F.O.B. Hull, Grimsby, Goole, Keadby, Liverpool, and Fleetwood.

Full particulars will be sent on application to above address.

LIVESEY'S PATENT WASHER.

This apparatus effects the most intimate contact between the liquor with which it is supplied and the gas passing through it, resulting in the complete removal of all particles of tar, increasing the ammonia strength of the scrubber and condenser liquor, and removing a large proportion of other impurities—notably, carbonic acid. The Washer is intended to work in conjunction with a scrubber. It occupies little space, and is inexpensive. It has been in successful constant use for nearly three years, does not become clogged with tar or corroded by the action of the liquor or gases, it gives three inches of pressure, and only needs a supply of liquor to keep it in regular action without any further attention.

For Particulars and Prices apply to

Messrs. DEMPSTER AND SONS, ELLAND, HALIFAX, for the North;

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Messrs. WILLEY AND CO., Commercial Road, EXETER, for West of England and South Wales;

Or to the PATENTEE, 589, OLD KENT ROAD, LONDON, S.E.

IMPROVED
COMPENSATING GAS-METER.
HUNT'S PATENT.

This Meter supplies a want long felt, by putting an end to the loss sustained by Gas Companies through the overworking of their Meters.

These Meters can now be supplied in either TIN-PLATE or CAST-IRON CASES, and OLD METERS converted to this plan. GAS COMPANIES and CORPORATIONS will find it to THEIR ADVANTAGE to adopt these Meters.

EXTRACTS FROM REPORTS.

"I am able to report that the Meters have given in each test most satisfactory results."—*Mr. H. Sporne, City of London Meter Inspector.*

"I consider the arrangement is a great improvement upon the Meters in present general use."—*Mr. T. Jackson, Meter Inspector, Birmingham.*

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COPIES OF REPORTS SENT ON APPLICATION.

MANUFACTURED BY

JOHN BENT & SON,

WET AND DRY GAS-METER AND GAS APPARATUS MANUFACTURERS,

BELL BARN ROAD, BIRMINGHAM.

Established 1830.

WILLIAM SUGG'S IMPROVED SYSTEM OF STREET LIGHTING.

Results obtained from WILLIAM SUGG'S large Argands for Street Lighting, by Mr. William King, Engineer to the Liverpool United Gas Company:—

ARGAND BURNER, WITH TWO CONCENTRIC FLAMES.

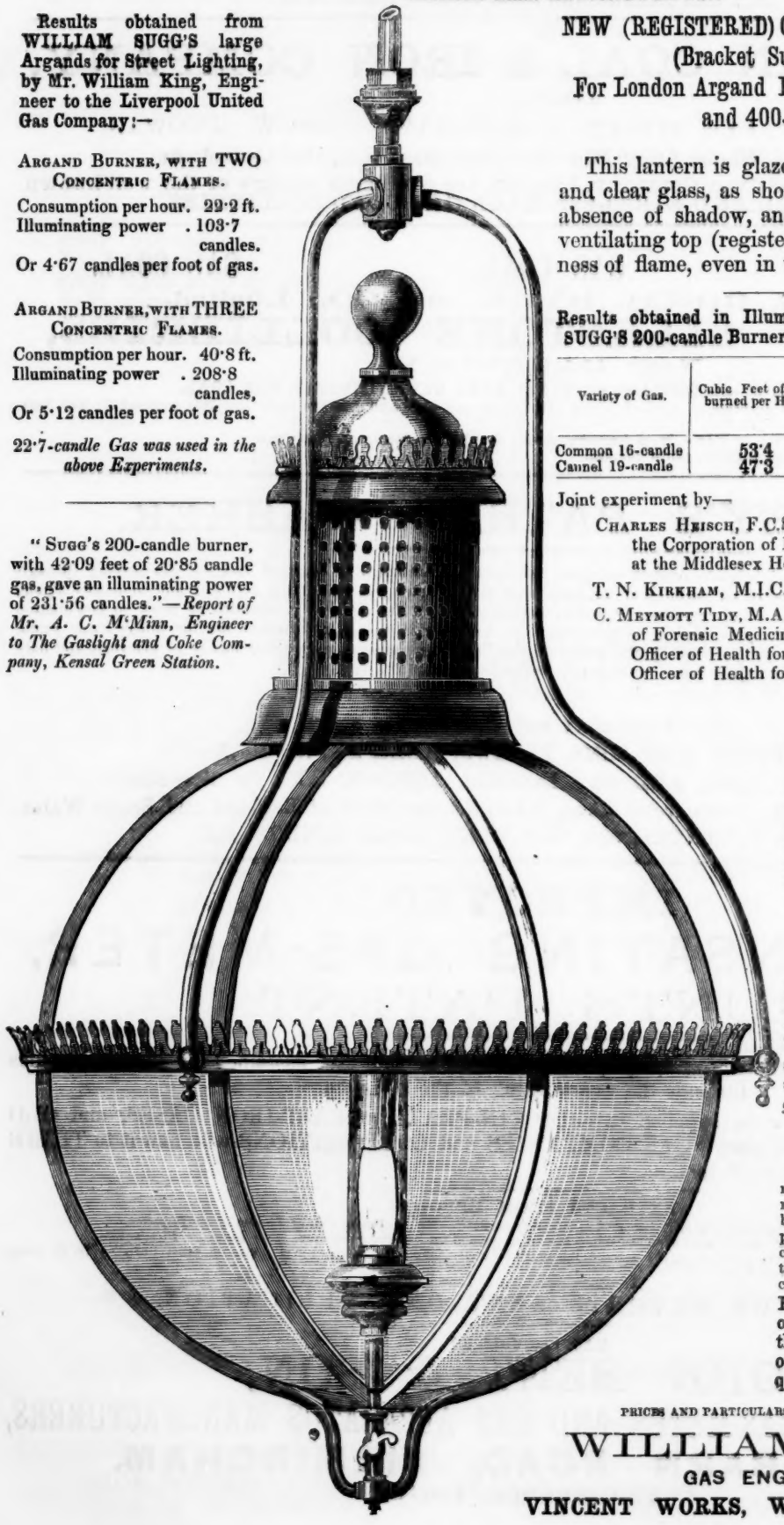
Consumption per hour. 29·2 ft.
Illuminating power . 103·7 candles.
Or 4·67 candles per foot of gas.

ARGAND BURNER, WITH THREE CONCENTRIC FLAMES.

Consumption per hour. 40·8 ft.
Illuminating power . 208·8 candles,
Or 5·12 candles per foot of gas.

22·7-candle Gas was used in the above Experiments.

"SUGG'S 200-candle burner, with 42·09 feet of 20·85 candle gas, gave an illuminating power of 231·56 candles."—*Report of Mr. A. C. M'Minn, Engineer to The Gaslight and Coke Company, Kensal Green Station.*



NEW (REGISTERED) GLOBE PATTERN LANTERN,
(Bracket Suspension Light,)
For London Argand Burners of 30, 50, 100, 200, and 400-Candle Power.

This lantern is glazed with opal reflecting panes and clear glass, as shown, thus securing an entire absence of shadow, and is fitted with the new self-ventilating top (registered), ensuring perfect steadiness of flame, even in the heaviest gale of wind.

Results obtained in Illuminating Power from WILLIAM SUGG'S 200-candle Burners with Cannel and Common Gas:-

Variety of Gas.	Cubic Feet of Gas burned per Hour.	Illuminating Power in Sperm Candles burning 120 Grains per Hour.	Number of Candles to which every Cubic Foot of Gas burned is equivalent.
Common 16-candle	53·4	228	4·25
Cannel 19-candle	47·3	252	4·76

Joint experiment by—

CHARLES HEISCH, F.C.S., Superintending Gas Examiner to the Corporation of London, late Professor of Chemistry at the Middlesex Hospital.

T. N. KIRKHAM, M.I.C.E., F.C.S.

C. MEYMOTT TIDY, M.A., M.B., Professor of Chemistry and of Forensic Medicine at the London Hospital, Medical Officer of Health for Islington, and late Deputy Medical Officer of Health for the City of London.

Mr. J. R. FRITH, Engineer of the Runcorn Gas-Works, Experimenting with a Sugg's Argand with three concentric rings, obtained an illuminating power of 220·5 candles, with a consumption of 45 cubic feet of 21-candle gas, or 4·9 candles per foot.

"The light exhibited last night (SUGG'S 200-candle burner and lantern) was equal to 360 candles—more than double that given by the old lamps, while the consumption of gas was exactly the same—40 feet per hour."—*Glasgow Herald*, April 25, 1879.

NOTICE.—Notwithstanding a number of statements which have been repeated in the public journals, that burners by other makers have surpassed these results, the reports of comparative experiments from which the above extracts have been copied conclusively prove that the "Sugg" **Burners give over 30 per cent. of Illuminating Power more than can be obtained from any other burners with the like quantity of gas.**

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GAS ENGINEER,
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BROAD STREET, BIRMINGHAM.

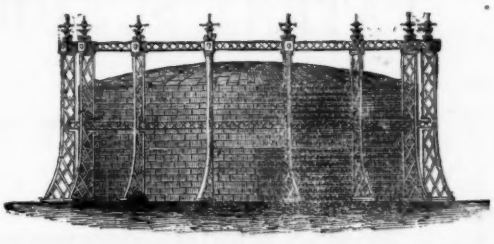
ESTABLISHED 1807.

MANUFACTURERS OF CRYSTAL GLASS CHANDELIERS,

WALL LIGHTS, AND LUSTRES FOR GAS AND CANDLES.

TABLE GLASS OF ALL KINDS.

CHANDELIERS IN BRONZE AND ORMOLU. MODERATOR LAMPS.



THE HORSELEY COMPANY,

LIMITED,

TIPTON, STAFFORDSHIRE.

LONDON OFFICE:

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GAS ENGINEERS, IRONFOUNDERS, &c.,

MANUFACTURERS OF

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AND ALL REQUISITES FOR EITHER

GAS OR WATER WORKS;

ALSO

MAKERS OF ROOFS, BRIDGES, &c.

S. OWENS & CO.,

HYDRAULIC, GAS, AND GENERAL ENGINEERS,

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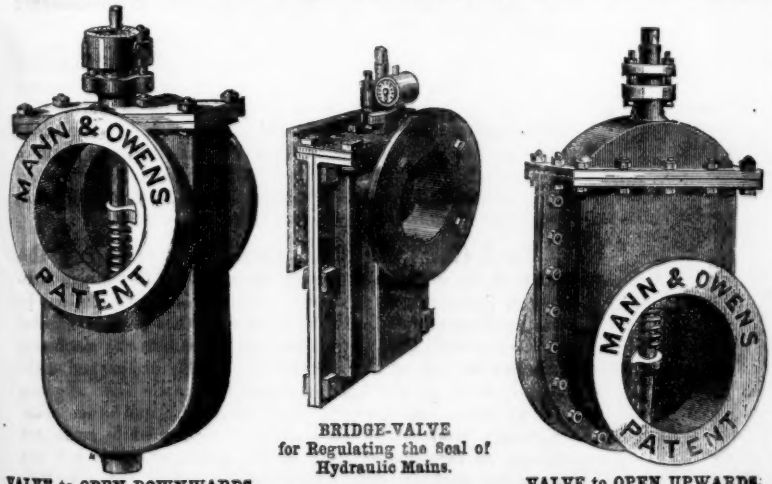
Sole Manufacturers of MANN & OWENS'

PATENT SCREW & CAM GAS-VALVE,

Protected by Royal Letters Patent in England, France, Belgium, & the United States of America.



BRIDGE-VALVE for Regulating the Seal of Hydraulic Mains.

VALVE to OPEN DOWNWARDS. VALVE to OPEN UPWARDS.

The SPECIAL ADVANTAGES of MANN AND OWENS' PATENT VALVE are as follows:—

1. Its non-liability to become set fast through varying temperature or from the deposit from crude gas. 2. It is made absolutely gas-tight by the simple action of a screw and cam. 3. Inconvenience through the breakage of springs or wedges setting fast cannot arise. 4. The face of the Valve is scraped and cleaned of any solid matter at each operation of opening or closing.

The Valve can be had to work either in a Vertical or Horizontal position.

Every Valve is carefully tested under pressure, and warranted perfectly sound and gas-tight.

INSTRUCTIONS FOR ORDERING.

State whether required for above or below ground, if Double Flange or Socket and Spigot Valves are wanted, or with loose Flanged Socket and Spigot pieces.

The Prices include Indicators to show extent to which Valve is open.

Also makers of PILLAR-VALVES, SELF-ACTING BYE-PASS VALVES, OUTSIDE RACK AND PINION VALVES, HYDRAULIC-MAIN VALVES, DISC-VALVES, &c.

Every description of Pumping Apparatus, Hydraulic Lifts, &c., suitable for use in Gas-Works, made to order.

PRICES, SIZES, AND FULL PARTICULARS, WITH COMPLETE ILLUSTRATED CATALOGUE, FURNISHED ON APPLICATION.

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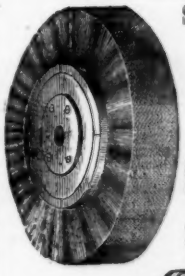

STEEL CASTING BRUSHES FOR HAND.

Circular Casting Brushes for Lathes and Brooms,

Admirably adapted for Cleaning Hot Castings, &c., and for general use in foundries, gas-works, chemical works, &c.

As Supplied to the Government and the leading English and Foreign Engineers, Gas-Works, &c.

Broom

No. 1, Brush,	3in.	wire,	2 rows,	15s.	dozen.	
„ 2, „	5	„	round,	22s. 6d.	„	
„ 3, „	3	„	4 rows,	22s. 6d.	„	
„ 4, „	2	„	4 „	21s.	„	
„ 5, „	3	„	4 „	22s. 6d.	„	
„ 6, Broom,	12in.	block,	7in. wire,	4 rows,	72s.	per dozen.
„ 7, „	16	„	7 „	4 „	96s.	„
„ 8, „	upright,		7 „	2 „	48s.	„
„ 9, „	12in.	block,	7 „	10 „	180s.	„
„ 10, „	16	„	7 „	10 „	228s.	„
„ 11, „	12	„	4 „	4 „	84s.	„
„ 12, „	16	„	4 „	4 „	72s.	„
„ 13, „	12	„	4 „	10 „	138s.	„
„ 14, „	18	„	4 „	10 „	180s.	„

Wheel,	6in.	dia.,	2¼	wide,	1½	wire projects,	5 rows,	1 hole, 10s. each
„	8	„	2½	„	1½	„	6 „	¾ „ 18s.
„	10	„	3	„	2½	„	6 „	¾ „ 31s.
„	12	„	3½	„	3	„	7 „	1 „ 28s. 6d.
„	14	„	3½	„	3½	„	7 „	1 „ 30s.
„	18	„	4	„	3½	„	8 „	1¼ „ 62s. 6d.

The "Champion" Iron Encased Forges.

Are specially suited for General Out-door Purposes, and will be found suitable to any climate.

PRICES.

SINGLE BLAST.

No. 1, 8 in. bellows, to heat ¾ in. sq. in 2 min. . 108
„ 2, 10 in. bellows, to heat 1¾ in. sq. in 2 min. . 138
„ 3, 12 in. bellows, to heat 2 in. sq. in 2 min. . 168

DOUBLE BLAST.

No. 4, 8 in. bellows, to heat 1 5/8 in. sq. in 2 min. 156
„ 5, 10 in. bellows, to heat 2½ in. sq. in 2 min. 192
„ 6, 12 in. bellows, to heat 3 in. sq. in 2 min. 264
„ 7, 14 in. bellows, to heat 3¼ in. sq. in 2 min. 318

The "Champion" Iron Encased Forge,

With Vice-Drilling Frame on stand complete.

No. 10, Double Blast, 10 in. bellows, to heat 2 in. sq. in 3 min., £15.

No. 11, Double Blast, 12 in. bellows, to heat 3 in. sq. in 2 min., £18.

No. 12, Double Blast, 14 in. bellows, to heat 3¼ in. sq. in 3 min., £22 .0s.

Sole Agents for the Lightning Screwing and Drilling Machines, Helical Pulley Blocks, Automatic Revolving Scrapers, Earth Borers, Tanite Co.'s Emery Wheels and Emery Grinders, Lathes, Genuine Morse Twist Drills, Cushman's Drill and Lathe Chucks, Patent Belt Screws, Patent Safety Belt Shippers, Casting Brushes, Shaped Diamonds, and a great variety of other Machinery always kept in stock or in progress.

LAMBETH HILL,

Queen Victoria St., London, E.C.

C. & W. WALKER,
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LONDON, E.C.

MANN & WALKERS' PATENT SCRUBBER.

By Letters Patent in Great Britain, Europe, and the United States of America.

By some important improvements recently patented, the purifying power of these Scrubbers has been much increased, and a stronger ammoniacal solution obtained, which is found to absorb a large portion of the carbonic acid contained in gas, effecting an important saving in money and labour in the lime purifiers, and where oxide only is used, the increase in the illuminating power of the gas obtained by these Scrubbers is shown in a remarkable degree, in consequence of the large quantity of carbonic acid removed from the gas.

It is to be particularly noted that the important results of these Scrubbers do not depend upon the machinery alone. The entire internal construction of the Scrubber bears an almost equally important part. For this reason, where it is desirable to convert existing Scrubbers, whose dimensions happen to be suitable, the work commences by ripping out the whole of the interior of the shell, and beginning the internal construction *de novo* from bottom to top.

Fifty million cubic feet of gas per 24 hours are purified from ammonia by these Patent Scrubbers in a winter's day in the gas-works of London, where the purity of gas supply is the highest in the world, under the chemical restrictions of the Board of Trade.

Generally, wherever a high standard of purification is maintained in the chief cities and towns of the British Provinces and of Europe, these Scrubbers have become established.

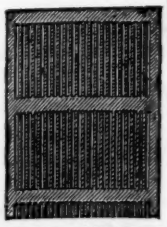
By their use the department of purification from ammonia upon a gas-works is made complete, without the aid of prepared oxide of iron, chemicals in purifiers, or any other supplementary process, and the whole ammoniacal residual product contained in the coal is absorbed and obtained in the form most profitable to a gas company, while the requirements of all Acts of Parliament and of the Board of Trade, relating to incorporate gas companies, are satisfied.

Foul Gas, properly condensed, entering the inlet is, by once only passing through the Scrubber, completely purified from ammonia with regular certainty day by day, without any further trouble, or any other process, effected by a very small quantity of clear water let into the machinery room at the top of the Scrubber, which is discharged at the liquor outlet at the bottom, from Newcastle coal at about 18 to 20 ounces strength, from Yorkshire and other coals generally from 25 to 30 ounces strength; while acidulated litmus or turmeric exposed at the Scrubber outlet will not show the slightest discoloration, and there is not a quarter of a grain of ammonia per 100 feet left unabsorbed.

They contain their own engine power, requiring only a small inappreciable quantity of steam from the gas-works boiler, and are then complete in themselves, ready for service.

Applications relating to dimensions and prices should be addressed to us, C. AND W. WALKER, 8, FINSBURY CIRCUS, LONDON, E.C., or to Mr. WILLIAM MANN, late Superintendent of the Chartered Gas-Works, BLACKFRIARS, LONDON; they should state approximately the largest make of gas in 24 hours on a winter's day, and the smallest make on a summer's day, to be purified.

R. DEMPSTER AND SON'S WOOD SIEVES FOR PURIFIERS,



WITH TAPER OR PARALLEL BARS,

MADE BY SPECIAL MACHINERY.

SCRUBBERS FILLED WITH BOARDS,

On our approved principle, for the extraction of Ammonia.

Prices on application. References to First-Class Engineers.

ROSE MOUNT IRON-WORKS,

ELLAND, Near HALIFAX.

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GAS *v.* ELECTRIC LIGHT.

WIGHAM'S PATENT GAS-BURNERS

FOR

STREET LIGHTING, &c., WHICH REQUIRE NO GLASS CHIMNEY.

Speaking of these burners, erected on the Thames Embankment, the Governor of The Gaslight and Coke Company, at the half-yearly meeting, Aug. 15, 1879, says:

"Any gentleman who may wish to see the light, may do so at the foot of Westminster Bridge, where it is in direct contiguity with the electric light, so that he will be able to judge for himself. There is a light there that completely excels the electric light in the intensity of its illumination, and in the scope of its diffusion. The lamps on Westminster Bridge are some of Mr. Wigham's."

SOLE MANUFACTURERS:

J. EDMUNDSON & CO., GAS ENGINEERS,

19, GREAT GEORGE STREET, WESTMINSTER, LONDON, S.W.

J. & J. BRADDOCK,

GLOBE METER-WORKS, OLDHAM,

MANUFACTURERS OF

WET & DRY CONSUMERS GAS-METERS,

OF THE HIGHEST EXCELLENCE ONLY;

BRADDOCK'S PATENT COMPENSATING GAS-GOVERNORS;

ALSO LICENSEES AND MANUFACTURERS OF

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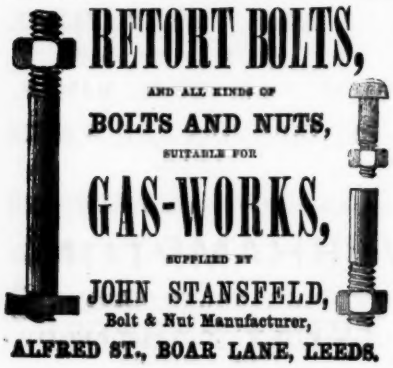

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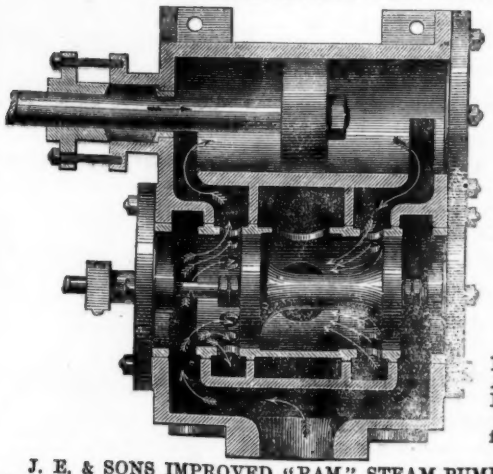

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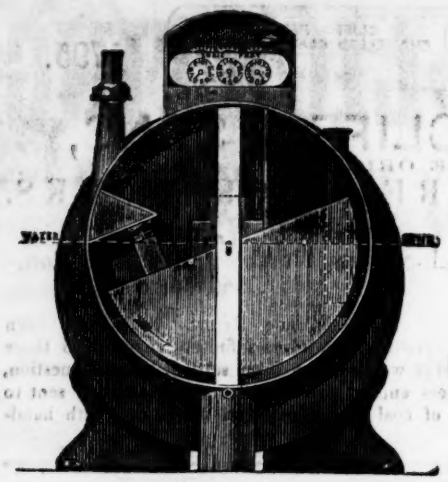

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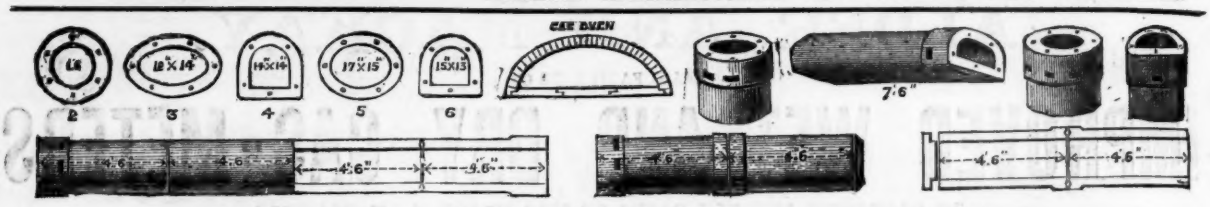

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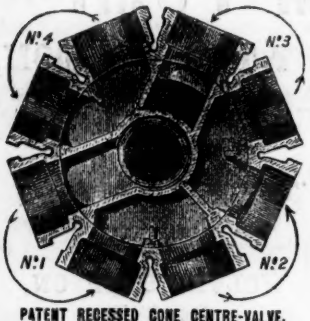

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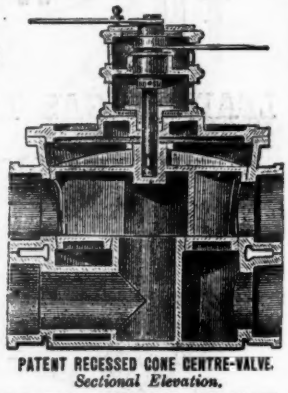

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